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Intestinal Parasites of Shetland Ponies in the North of Scotland

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Introduction.

The rearing and grazing of Shetland ponies in the north of Scotland is a fairly extensive enterprise. Some, bred in Shetland, are bought in at a young age but the majority are bred and reared on the mainland. At four years old they are sold as pit ponies to the coalfields in the north of England, while a few of the larger animals are utilised in Scottish pits. The number at present grazing is over a thousand, of which a good proportion is kept in Aberdeenshire.

In January, 1937, it was brought to the writer's notice by one of the leading Aberdeenshire breeders that the death-rate in one herd was abnormally high. Subsequent investigation and *post-mortem* examination of four ponies revealed that death was mainly due to severe infestation of the intestine with parasitic worms. A total of 25 species of nematodes and two species of cestodes were obtained from the intestinal contents. A list of the species is given and remarks have been added where necessary. Three of the ponies examined were infested with larvae of the horse bot fly (*Gastrophilus intestinalis*).

Two features of the *post-mortem* examination worthy of note were the extreme emaciation of the animals and the great thickening of the intestinal wall. The caecum in particular was markedly thickened, some portions reaching a thickness of three-quarters of an inch. Closer examination of the thickened areas revealed the presence of many cylicostome larvae some of which appeared to be calcified. Several very large ulcers, up to three inches in diameter, due to the presence of large numbers of *Triodontophorus tenuicollis* were also readily apparent on the caecal wall. The damage to the mucous membrane of the caecum was very extensive and it is not unlikely that this may have been largely responsible for the emaciation and death of the animals.

History and Management of Ponies Examined

The herd of ponies, 45 in number, under observation was bred in Orkney and brought over to the mainland in March, 1936, at the age of nine months. Their summer grazing consisted of rough waste land which was damp and mossy. On October 12th, 1936, several of the ponies were observed to be in poor condition and they were taken on to the lower lying fields of the farm which were under moderately good rotation pasture. Symptoms of unthriftiness and emaciation became apparent towards the end of the month, and the first pony died on November 16th, 1936. By January 16th, 1937, the mortality had risen to eight.

Similar losses were experienced in 1935 soon after the ponies were shifted from the same waste, mossy ground to their winter grazing. It is interesting to note, however, that during that same year another lot of ponies, which had been summered in Strathspey and wintered on the same low ground, suffered no losses. It seems clear, therefore, that infection was mainly obtained from the damp, mossy summer grazing, where conditions were ideal for the increase of parasitic worms.

It may not be out of place here to put on record the steps that were taken to reduce the losses from parasitic worms. In view of the young age of the animals, anthelmintics were discarded in favour of preventive measures. The ponies were removed to clean pasture and allowed an extra ration of hay and bruised oats. Under this treatment, the animals gradually improved in condition and no further deaths occurred. Indeed, the farmer was so impressed with the condition of the ponies after the use of an extra food ration, that he decided to graze the same worm infested pastures the following year, and rely on extra feeding to reduce the losses from helminths. The result was highly satisfactory. No deaths occurred and the health and condition of the ponies were excellent.

CLASS INSECTA

Genus *Gastrophilus* Leach, 1817
G. intestinalis (de Geer, 1776)

The larvae or bots of this fly were found in the characteristic clusters towards the pyloric end of the stomach. From 60 to 80 bots were recovered from each of three ponies while one was unaffected. Little importance is attached to bots unless present in large numbers. It is difficult to say whether these numbers are significant or not but, since all bots produce harmful tonic excretions, it is not unlikely that they played some part in reducing the health of the animals.

CLASS CESTODA

Genus *Anoplocephala* E. Blanchard, 1848
Anoplocephala perfoliata (Goeze, 1782) E. Blanchard, 1848

This cestode occurred in the large, and to a less extent, in the small intestine of three of the ponies. It produces inflamed areas at the points of attachment to the mucosa. One pony yielded 325 specimens and another 225 specimens.

Anoplocephala mamillana (Mehlis, 1831) R. Blanchard, 1891

This species was met with in two ponies in the small intestine. One pony yielded 25 specimens and the other nine specimens.

CLASS NEMATODA

Genus *Trichostrongylus* Looss, 1905
Trichostrongylus axei (Cobbold, 1879) Rail. & Henry, 1909

This species was present in small numbers, varying from 5 to 40 specimens, in the stomach of all ponies examined. It burrows into the mucosa and produces irregular circumscribed thickenings. It is interesting to note that, in a survey of helminths in sheep, Robertson (1937) recovered this small stomach worm from 24·2 per cent. of lambs examined in numbers varying from 10 to 200. It has also been recovered by the writer from the abomasum of cattle in the north of Scotland.

Genus *Habronema* Diesing, 1861
Habronema microstoma (Schneider, 1866) Ransom, 1911

A total of 56 examples of this nematode, several of which were immature, was recovered from the stomachs of three ponies.

Genus *Ascaris* Linnaeus, 1758
Ascaris equorum Goeze, 1782

This parasite occurred in large numbers in all but one of the ponies, the maximum number recovered from one animal being 103 adults. Many larvae were also obtained from all parts of the small intestine. With the exception of a small number of *Trichonema* species this was the only nematode occurring in the small intestine.

Genus *Oxyuris* Rudolphi, 1803
Oxyuris equi (Schrank, 1788) E. Blanchard, 1849

This parasite was found in the right dorsal colon of one pony. Five specimens (three females and two males) were obtained.

Genus *Strongylus* Müller, 1780
Strongylus edentatus (Looss, 1900)

The genus *Strongylus* contains possibly the most pathogenic worms inhabiting the intestinal tract of equines. Comparatively few adults of this species were recovered from the lumen of the right ventral colon and caecum of all ponies examined, but, in some cases, as many as ten nodules containing the coiled worms occurred per square inch of the mucosa.

Strongylus vulgaris (Looss, 1900)

This nematode was recovered in very large numbers from the caecum of all ponies. Immature adults were also obtained from cysts underlying the mucosa and in aneurysms of the ilio-caeco-colic artery and its branches.

Genus *Triodontophorus* Looss, 1902
Triodontophorus serratus (Looss, 1900)

This species was found in the caecum of one pony in very small numbers.

T. brevicauda Boulenger, 1916

Twenty-two specimens of this uncommon nematode were recovered from the caecum of one pony.

T. tenuicollis Boulenger, 1916

This species occurred in countless numbers in the right dorsal colon in all ponies examined. In several cases it was found adhering in hundreds to ulcers which were scarcely visible until the worms had been removed. It is by far the commonest species of *Triodontophorus* occurring in equines.

Genus *Craterostomum* Boulenger, 1920
C. acuticaudatum (Kotlan, 1919)

This species was isolated from the contents of the right dorsal colon in small numbers. On account of its reddish-brown colour it is rather difficult to find. Both mature and immature specimens were examined. The latter agreed closely with *C. tenuicauda* Boulenger, 1920, and, as Baylis (1929) suggests, this is probably a synonym of *C. acuticaudatum*.

Genus *Trichonema* Cobbold, 1874
Sub-Genus *Trichonema* le Roux, 1924
Trichonema (*Trichonema*) *longibursatum* (Yorke and Macfie, 1918)

This is one of the commonest species of *Trichonema*. It was found in thousands in the caecum and large colon of all ponies examined.

T. (*Trichonema*) *minutum* (Yorke and Macfie, 1918)

This species, although collected from the caecum and large colon of all ponies, was not abundant.

T. (*Trichonema*) *calicatum* (Looss, 1900)

This species was recovered from the caecum and large colon of all ponies in numbers about equal to those obtained for *T. longibursatum*.

T. (*Trichonema*) *poculatum* (Looss, 1900)

Of all the *Trichonema* occurring in equines this species is generally regarded as being the least common. About 200 specimens were recovered from the caecum and large colon of one pony.

A detailed study of the morphology of the Shetland pony specimens showed distinct differences from those featured in Looss' (1902) diagram for this species. For example, the rays of the median lobe were much thicker and the slender lateral projections were absent. The genital cone was larger and appeared to be protrusible. The buccal capsule was also much larger as indicated by the following measurements :—

	Buccal Capsule	
	Length in μ	*Width in μ*
Looss (1900)	70	59
Baylis (1929)	60–82	56–60
Robertson	80–87	64–80

These differences, however, do not appear to be sufficient to warrant the creation of a new species.

Sub-Genus *Cylicocyclus* Ihle, 1922

T. (*Cyclicocyclus*) *insigne* (Boulenger, 1917)

Large numbers of this species were collected from the large colon of all ponies examined.

T. (*Cylicocyclus*) *nassatum* (Looss, 1900)

This species was met with in small numbers in two ponies. It occurred in the large colon.

T. (*Cylicocyclus*) *elongatum* (Looss, 1900)
T. (*Cylicocyclus*) *elongatum* (*Looss*) var. *Kotlani* (Ihle, 1920)

Eight males and ten females were collected from the caeca of two ponies. Two of the males appeared to belong to the var. *Kotlani*. Considerable variations occurred in the measurements of the length, oesophagus, buccal capsule and dorsal ray of the males of *elongatum*. Looss (1902) gives the length of the median ray of the bursa as 0·86 mm., but some specimens exceeded this by over 0·5 of a millimetre, the maximum length being 1·46 mm.

Sub-Genus *Cylicostomum* Ihle, 1922

T. (*Cylicostomum*) *labiatum* (Looss, 1902)

Three worms of this species were found in the large colon of one pony.

T. (*Cylicostomum*) *labratum* (Looss, 1900)

This species was found in all ponies and in one case from 200 to 300 specimens were recovered from the large colon.

T. (*Cylicostomum*) *coronatum* (Looss, 1900)

About a hundred specimens were obtained from the caecum of one pony. Some of the specimens had a much wider buccal capsule (up to 50μ) than that given by Baylis (24 to 28μ) and occasionally it was difficult to decide whether they were *coronatum* or *ornatum*.

T. (*Cyclicostomum*) *ornatum* (Kotlan, 1919)

A few specimens were collected from the caecum of two ponies.

Sub-Genus *Cylicocercus* Ihle, 1922

T. (*Cylicocercus*) *catinatum* (Looss, 1900)

This species was met with only once, when two females were collected.

T. (*Cylicocercus*) *goldi* (Boulenger, 1917)

This species was collected in very small numbers from the caecum and colon of two ponies.

Sub-Genus (*Cylicodontophorus*) Ihle, 1922

T. (*Cylicodontophorus*) *euproctus* (Boulenger, 1917)

Two males of this species were found in one pony.

Genus *Gyalocephalus* Looss, 1900

Gyalocephalus capitatus Looss, 1900

Syn. *G. equi* Yorke and Macfie, 1918

Eleven specimens were collected from the caecum of three ponies. Five of the specimens were males with projecting genital cones which showed great variation in length.

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R.A.S.E. CENTENARY SHOW

A fortnight hence the Centenary Show of the Royal Agricultural Society of England will open in Windsor Great Park. Everything indicates that it will be the greatest and best in the history of the Society: certainly the display of livestock will be among the finest seen at any show in this or any other country—the cattle entries alone total just under 2,000 head, and horses, sheep and pigs are universally strong sections. The Mining Association of Great Britain is arranging to hold an exhibition of pit ponies and 100 ponies will take part. His Majesty the King has promised to visit the show on two days.

Tuberculosis in the Goat

W. M. McKAY, M.R.C.V.S.

Tuberculosis in the goat is a condition very rarely encountered by the veterinarian in this country.

The first case recorded was that of M'FADYEAN and EDGAR in 1892 in which lungs and bronchial glands were found tuberculous and the diagnosis was confirmed by histological examination.

A second case was recorded by GRIFFITH (1917) in a six- to eight-months-old goat reared on cow's milk. The pulmonary lesions in this case were apparently extensions from the small intestine. In this case the organism was typed, and was found to be dysgonic bovine.

A third case was described by SCHWABACHER (1934) in a goat of 14 months fed from seven days old on boiled cow's milk. The *post-mortem* findings were entirely confined to the thoracic cavity. Bacteriological examination proved the infection to be dysgonic bovine.

BEGLEY (1938) recently described a case in a broken-mouthed she-goat in Ireland. In this case the disease involved the lungs, mediastinal and bronchial glands, pleura, suprasternal glands, peritoneum, liver and hepatic gland and the pharyngeal gland.

Workers have reported cases of caprine tuberculosis in Germany, America, India, and South Africa, in all of which the disease was mainly pulmonary. CARMICHAEL (1938) in Uganda has shown the disease to be relatively common in that country, where the *post-mortem* findings were again largely of pulmonary disease. Bacteriological examination proved all of the ten cases recorded to be due to bovine infection.

FOURIE, quoted by CARMICHAEL (1938), described a case of tuberculosis in a goat in South Africa which was in a paddock near some tuberculous cattle. No clinical symptoms were seen, but extensive pulmonary tuberculosis was found on autopsy.

IYER, also quoted by CARMICHAEL (1938), recorded six cases of tuberculosis in Indian goats out of a total of 943 examined.

Experimental work on tuberculosis in goats has been carried out in this country by GRIFFITH (1907 and 1911).

GRIFFITH showed that the subcutaneous injection of the bovine bacillus produced generalised tuberculosis, fatal when a large dose was employed. Feeding experiments sometimes produced generalised progressive tuberculosis, and at others disease more or less limited to the mesenteric and adjoining glands.

The same worker showed that the human bacillus was not able to produce generalised progressive tuberculosis in the goat, which appeared to be resistant to it.

The present writer during more than two years spent among Somali herds of goats did not encounter a single case of tuberculosis: this in spite of the high incidence of phthisis among the herd owners, who frequently kept goats with them in their ill-ventilated camel mat tents.

GRIFFITH (1911) showed that eight days after the ingestion of human tubercle bacilli the organisms were found in submaxillary and mesenteric glands and lung. The same worker showed that the subcutaneous injection of bovine culture resulted in the excretion of organisms in the milk of milch goats in a matter of a few days.

The case now to be described is believed to be the first of caprine tuberculosis recorded in Scotland.

The animal was a 3½-year-old male, in good condition. It had been in its owner's possession from the age of two weeks, and had been at first fed with cow's milk, although the owner states that it was not given for very long since the goat disliked it.

The mother was considered "thin" and died a short time after the birth. The goat was obtained as the owner believed it would cure a severe outbreak of contagious abortion in his cows. It was therefore housed in the cowshed or in a covered court. He was also free to roam with poultry, and in fact apparently preferred to do so rather than with the cattle. GRIFFITH (1931), however, considers the goat resistant to avian infection. There was no history of a cough at any time nor of any indication of disease beyond a suggestion that the animal was possibly a little less lively during the last few months it was alive. In spite of this suggestion the reason the animal was slaughtered was its spirited and lively behaviour, and numerous complaints that the animal was dangerous.

POST-MORTEM FINDINGS.

The carcase was that of a male goat in good condition. The abdominal viscera were not available for examination by me, but were reported to be free from obvious disease. It is likely that if disease actually did exist it was in fact slight. Examination of the thoracic cavity showed gross tuberculous lesions. The whole pleura was affected with acute diffuse tuberculous pleurisy with numerous pendulous encapsulated calcareous lesions. The parietal pleura showed numerous similar lesions, varying in size from that of a small pea up to about twice the size of the blade of a scalpel, and of the same shape, with smoothly rounded borders. These lesions, when incised, were found to be calcified and faintly greenish-white in colour.

The lungs showed numerous similar lesions just under the surface of the lung, and raising

it into small mounds. Both lungs were equally affected, and the lesions, apart from the difference in colour, were exactly similar to those met with in bovine cases of tuberculosis.

The bronchial and mediastinal glands were enlarged and contained calcified lesions of the same type as those on the pleura and in the lungs. The carcase showed no other lesions of tuberculosis.

One pendulous pleural lesion and a mediastinal gland were taken for bacteriological examination at the City Hospital Laboratory, Aberdeen. It was hoped that the organism responsible might be typed.

The diagnosis of tuberculosis was confirmed, but the lesions were inactive, and no living organisms could be recovered. It was therefore not possible to type them.

Summary and Conclusions

The literature on British cases of tuberculosis in the goat is discussed.

What is believed to be the first case of caprine tuberculosis in Scotland is recorded.

The subject was a 3½-year-old male goat suffering from pulmonary tuberculosis.

The *post-mortem* findings are described.

Acknowledgments.—I desire to express my thanks to Dr. John Smith, Director of the City Hospital Laboratory, Aberdeen, for his examination of the specimens, and to W. Jackson Young, Esq., F.R.C.V.S., D.V.S.M., for his help and advice.

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MILK RECORDING IN SCOTLAND

With the exception of Denmark, Scotland has now a higher proportion of officially recorded dairy cows than any other country under a voluntary system. This claim is made in the Scottish Milk Records Association's report for 1938 presented at the annual meeting in Glasgow. The number of herds officially tested during the year was 871 with 38,410 cows, an increase of 36 herds and 861 cows compared with 1937.

Cases of grass disease amongst horses are reported from Ross-shire. Several horses have been lost in the Invergordon area.

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At a recent meeting of the Senate of the University of London the Regulations for the Second Examination in Veterinary Science for Internal and External Students (Red Book, 1938-39, pp. 457-461; Blue Book, September, 1938, pp. 1714-1720) were amended for examinations in and after 1941. Copies can be obtained from the Academic and External Registrars.

Acute Arthritis

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Under this heading Lamont (1938), in a paper to the Annual Congress of the National Veterinary Medical Association, referred to a condition which we have been meeting with, with increasing frequency, in Northern Ireland. On many farms where this acute arthritic condition had occurred the history supplied is that the pigs were purchased, usually in a fair, about a week previously. The pigs generally are from 10 to 14 weeks old. After a few days on the new farm one or more pigs show evidence of a very pronounced lameness in one leg. In a short time two, three, or all four legs are involved and the pig is recumbent, obviously ill, and suffering considerable pain. Any attempt to move the pig is greeted with squealing. The pigs cease feeding and lose condition quickly. As a rule very high temperatures (up to 109° F.) are recorded. In occasional cases the onset of symptoms may be delayed longer than one week. In one case investigated the pigs had been at the new farm for four weeks. Over 50 per cent. of the bought-in pigs may become affected and among the affected pigs the mortality rate may be as high as 75 per cent. or more.

Post-mortem Examination.

The joints are found to be the main seat of pathological change. They are swollen, and on incision one finds that the normal synovia has disappeared to be replaced with what appears to be inspissated serum. This material is of a faintly yellowish-grey colour and almost fibrinous-like in consistency. The articular cartilages may be pronouncedly pinkish instead of their normal blue-grey glistening appearance. In some instances a fibrinous pleurisy, peritonitis, and pericarditis has also been present.

Bacteriology.

At first cultures were sown on trypsin agar slopes and plates. In one or two instances a few colonies of a Staphylococcus were recovered but almost invariably the cultures were negative and the Staphylococcus was regarded as a contaminator. Smears from the joints showed a few slender Gram-negative bacilli, but these were not recovered on the trypsin agar. In case these organisms should prove to be an atypical organism of the swine erysipelas type a number of pigeons and rabbits were inoculated from a series of cases but with negative results. Chocolate blood agar was ultimately substituted for the trypsin agar and, in a series of five consecutive outbreaks

on different farms involving in each instance five or more animals, positive cultures of this slender slightly Gram-negative bacillus were obtained. Growth was scanty and only visible after incubation for 48 to 72 hours. Numerous very tiny colonies were then visible. Smears showed that on cultivation considerable pleomorphism was present. No growth was obtained on media without the addition of haemoglobin and a cooked blood trypsin agar has given the best results. Cultures are difficult to maintain and despite subcultivation every 48 hours tend to die out.

In the cases where fibrinous pleurisy, peritonitis, and pericarditis were present, smears from the fibrinous deposits particularly on the myocardium showed this slender Gram-negative bacillus. Cultures from the fibrinous material on the chocolate blood agar were positive after 48 hours' incubation. Liver, spleen, and heart blood cultures were negative.

In two instances recently a similar condition involving the joints has been met with in piglings while still on the sow. The sows were located on two different widely separated farms. The symptoms, including the acute febrile illness, were identical with those seen in the older pigs. The following record of one of these cases is given. Originally there were twelve piglings in the litter and they had grown normally until they were exactly seven weeks old. The first pigling to become affected was noticed on March 27th, 1939. It had swollen painful joints and was unable to walk. It was destroyed on March 31st, 1939.

No. 2 pigling exhibited similar symptoms 28/3/39 (morning) and died 31/3/39.

No. 3 pigling exhibited similar symptoms 28/3/39 (evening) and died 30/3/39.

No. 4 pigling exhibited similar symptoms 29/3/39 (morning) and died 29/3/39.

No. 5 pigling exhibited similar symptoms 30/3/39 and was treated.

No. 6 pigling exhibited similar symptoms 31/3/39, was killed 31/3/39 (temperature subnormal).

No. 5 pigling was injected subcutaneously with 30 c.c. soluseptasine, 20 per cent. (May & Baker). It was acutely ill with a temperature of 108·4° F. Recovery was complete in 24 hours.

Three of the pigs which died were obtained immediately after death and submitted to cultural examination using chocolate agar. A growth of the slender Gram-negative pleomorphic organism referred to was obtained from the affected joints. Two of these pigs were affected with a fibrinous pleurisy, peritonitis, and pericarditis. Cultures of the organism were obtained from the fibrinous deposits, growth being visible in from 48 to 72 hours. Experimental attempts to set up an artificial infection of the joint by injecting an emulsion of the haemophilic organism in one pig proved negative.

Treatment.

Hitherto treatment of this acute joint condition has been most unsatisfactory, but recent experimental treatment with (1) soluseptasine 20 per cent. solution and (2) with May & Baker's "693" has given results which indicate that the problem of treatment has been solved. Some 30 pigs in five outbreaks have been treated with one death and this in a pig recording a temperature of 96° F. The dose of soluseptasine used was 30 c.c. of a 20 per cent. solution. One dose invariably effected complete recovery. The best results were obtained in pigs treated shortly after the onset of symptoms; recovery in these cases was much quicker than in those where treatment was delayed. Equally good results have been been obtained with the use of "693" (May & Baker). The dose used is four tablets (2 grammes) and although only six pigs have been treated with "693" all six pigs were completely recovered in 48 hours.

Summary

A disease of pigs characterised by fever and acute arthritis is described. The successful cultivation of an organism of the Haemophilic group from the affected joints and from a fibrinous pericarditis, pleurisy, and peritonitis is recorded. This organism appears to be identical with *Haemophilus influenzae suis* recorded as being commonly present in the lungs of pigs affected with piglet influenza in Northern Ireland by Shanks and Lamont (cited by Lamont (1938)). One experimental attempt to reproduce the disease by inoculation of this organism has given negative results.

A highly successful means of treatment is described.

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R.A.V.C. DEPOT

The Royal Army Veterinary Corps record office and the corps depôt have been moved from Woolwich to Aldershot. The record office has been established at Thornhill, and the depôt is at the Veterinary Hospital.

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A well-known Harworth (Doncaster) farmer, Mr. Kent, has a ewe which has produced in all 20 lambs. This includes five consecutive sets of triplets for the last five seasons.

CLINICAL COMMUNICATION

Sway-Back in Lambs

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Introduction.

In the *Veterinary Record*, December 26th, 1936, Innes discusses sway-back in lambs, describing a condition characterised by a demyelination of brain tissue, analogous to Schilder's disease in man. He reports that the disease is prevalent in many countries, and it is the fact of it having previously been recorded in Bedfordshire, and of its recurrence this lambing season, that has prompted the author to present his findings in this outbreak.

Subjects.

Kerry-cross lambs, from birth up to four days old.

History.

The farm in question is on medium sandy soil, which although at a considerable elevation, is badly drained, most of the pastures at the time of visiting being waterlogged. The ewes were bought and lambed on the farm last season, at which time the owner sustained considerable loss of ewes from pregnancy toxaemia, but no loss of lambs.

This season he has lost 30 of 150 lambs in the manner about to be described.

Incidence.

Lambs of either sex, and one or both of twins, were impartially affected. It has been a notable season in this part of the country for twin lambs, and this farm has been no exception.

Symptoms.

Some of the affected lambs were stillborn and on one of these (case "A") autopsy was performed. The other affected lambs in the majority of cases lived for two days only, four others being autopsied at two days old after destruction by chloroform (cases B, C, D and E).

In no case was there fever. The lambs exhibited varying degrees of locomotor weakness, from complete ataxia, through paraplegia, and paresis, to unsteady gait. Those that could not move were presumed to die from starvation, being unable to reach the teats of the ewe.

In one case it appeared evident that the lamb was unable to see, and it made fruitless attempts to find the ewe; however, close examination of the eyes showed no macroscopic lesion, and pupillary reflex was present. This same lamb made aimless movements with its head, presenting an appearance very similar to that of a dog with ear trouble.

Pedal reflex was present in those lambs not completely paralysed. The lambs did not scour, and respiration was accelerated only in these lambs struggling to rise.

No other symptoms were manifest.

Post-mortem Examination.

In each case, apart from *post-mortem* changes in the liver and kidneys, no lesions were apparent other than those in the brain, the spinal cord being free from macroscopic lesions. In all cases, the carcases were in good condition, the skull-bones being well formed.

Case B.—Destroyed by chloroform.

On opening the cranial cavity in the approved manner, a serous fluid exuded from the epidural space, the meninges being separated by a distance of a quarter of an inch from the cranial bones.

Macroscopically, the first conspicuous finding was an atrophy of the left hemisphere.

The meninges showed congestion (? result of chloroform) but no areas of inflammation. Transverse section through the hemispheres at the level of the occipito-temporal fissure revealed circumscribed areas of demyelination in the white matter subjacent to the occipital cortical grey matter. Cavitation was present in a small region of the left occipital pole. Closer examination under reflected light showed fibrils (gliosis) across the cavity which was filled with a clear fluid.

The optic thalamus was normal.

Case C.—Destroyed by chloroform *in extremis*.

The lesions were almost identical with those of case B, but were confined to the occipital poles, and cavitation was very pronounced.

Case A.—Stillborn 12 hours before *post-mortem* examination.

The lamb was in good condition, and well formed. On opening the cranial cavity, no congestion or fluid was evident. Section of the hemispheres revealed a very narrow band of demyelination beneath the cortical grey matter in the upper and outer segments of the periphery. The lateral ventricles were not dilated.

Case D.—No lesions were seen in the brain.

Case E.—The lesions resembled those in case B.

Discussion.

While the author makes no attempt to describe a cause for the condition, there are certain features of the case which appear worth considering.

The outbreak from a clinical viewpoint bears no resemblance to an infectious disease, as evidenced by the clinical examination of individuals (absence of fever, etc.) and history of no previous outbreak and of no new addition to the flock. The lambs do not appear to acquire the disease by contagion, since only one of the twins might be affected.

Bacteriological examination proved negative.

(*Concluded at foot of column* 1, *page* 786)

ABSTRACTS

[Treatment of Equine Strongylidosis with N-Butyl Chloride. (Preliminary Note.) Harwood, P. D., Underwood, P. C., and Schaffer, J. M. (1938.) *N. Amer. Vet.* **19.** 7. 44-46.]

N-butyl chloride has been tested as it is cheaper than N-butylidene chloride which in turn is a less toxic drug than oil of chenopodium or carbon tetrachloride. A dose of 0·1 c.c. per pound body weight was given in eight times its volume of linseed oil to two horses. This dose removed 99 per cent. of the cyclostomes and 74 and 100 per cent. of the strongyles from the horses. A dose of 0·075 c.c. per pound body weight was given in ten times its volume of linseed oil to one horse and this dose removed 95 per cent. of the cyclostomes. Ten times the therapeutic dose (1 c.c. per pound of body weight) proved fatal to two horses in two days.

A. T. P.

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[The Possibility of Treating Schistosomiasis with Unguenta. Cawston, F. G. (1938.) *J. Trop. Med. and Hyg.* Jan. 1st, 1938. Reprint of 6 pp.]

Following a short discussion on the use of unguenta in medicine, Cawston mentions the results of his investigations on the use of antimony in an eucerin base. He gives details of treatment of a twelve-year-old schoolboy, whose blood-stained urine contained numerous ova of *Schistosomum haematobium*, with eucerinum containing anthiomaline. From his observations on this patient, the author concludes that anthiomaline is not superior to tartar emetic for use as an unguent. Since no ill-effect has been recorded from administering tartar emetic by the bowel, its incorporation in a suitable ointment base appears, in the author's opinion, to be a more promising method of giving the drug *per rectum* than in solution. Cawston also mentions that tartar emetic in a reliable base might prove an asset for administration by the bowel for cattle infested with nagana as well as some bowel parasites; since individual animals have varied powers of retaining what is introduced into the bowel an adequate number would require to be treated before drawing any conclusions.

J. N. O.

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[Favourite Sites of Schistosomes and a Consideration of Their Destruction in Stock. Cawston, F. G. (1938.) *J. Trop. Med. and Hyg.* Sept. 15th, 1938. Reprint 2 pp.]

Cawston mentions that symptoms of schistosomiasis in stock are likely to escape notice or be confused with other affections. He also observes that the diagnosis of schistosome infection of man and stock depends upon the appearance of the escaping ova and recovery of adult worms is practically impossible before the death of the host; thus nasal schistosomiasis can be readily distinguished from allied conditions, such as rhinosporidiosis, by the recovery of fluke ova. Although he recognises the difficulty of treating stock suffering from schistosomiasis, Cawston believes that better control would result from slaughtering affected cattle than by adopting what might ultimately prove to be an incomplete cure. Armed with complete information about the life-cycle of the various schistosomes of stock, the author considers it possible to effect a speedy decrease of schistosome infection in any locality where suitable co-operation with native owners can be obtained. He adds the warning that a mollusc must not be condemned as a vector of domestic animal schistosomes simply because it may sometimes harbour a cercaria possessing a bifid tail, of which, he adds, there are many harmless ones.

J. N. O.

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[Debatable Tumours in Human and Animal Pathology. Giant-cell Tumour of Bone. Dawson, E. K., Innes, J. R. M., and Harvey, W. F. (1938.) *Edin. M. J.* N.S. (iv.) xlv. 491-504. 45 photographs.]

This is a relatively benign tumour of bone which may be regarded as occupying an intermediate position between inflammatory granulomatous tissue and simple neoplastic growth (blastoma). It is a reaction on the part of osteogenic tissue, arising from persistent embryonal mesenchyme, to trauma with haemorrhage. Usually it progresses slowly and ultimately undergoes regression, but in rare cases malignancy may supervene. Such malignant growths are osteogenic sarcomata.

The component cellular elements are of two types, the more important being a small spindle cell with an oval nucleus. It is less differentiated than the more conspicuous multinucleated

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Menzies, by analogy with an outbreak of a similar disease in Western Australia, argues that the disease may be the result of a copper deficiency, but evidence in this country for or against this is so far negligible.

It may be of importance that this year has seen a very wet lambing season, as compared with the drier one of last year: the pastures, as stated above, were in a sodden condition: further, this year has seen an extraordinary number of twin lambs.

References

Innes, J. R. M. (1936.) *Vet. Rec.* **48.** 52. 1539-1549.
Menzies, D. W. (1938.) *Ibid.* **50.** 31. 971-974.

giant cell which characterises the tumour. The latter is regarded by the authors as a giant bone-cell produced by fusion of small primitive osteogenic tissue cells, its function being osteoclastic. There is a scanty homogeneous or loosely fibrillar intercellular substance. Though the active growth is bone-resorptive, it contains a variable amount of new bone and osteoid. There is an abundant blood supply, the vessels being largely sinusoidal or even cavernous, with thin endothelial walls closely bordered by tumour cells.

Regression is indicated by the presence of collagenous fibrous tissue and cysts, bone formation and disappearance of giant cells. Regression and repair are of some importance as they afford a ready explanation for those rare cases of spontaneous cure that are recorded.

The relationship to osteitis fibrosa is discussed. The solitary giant-cell tumour is not to be regarded as "localised osteitis fibrosa" for there are no changes in blood calcium and phosphorus and no general osteoporosis such as occur in generalised osteitis fibrosa. However, the occurrence of giant-cell tumours in this disease is explained by the fact that rarefaction of the bones caused by hyperparathyroidism renders them more liable to trauma, haemorrhage and consequently multiple reactions of the giant-cell type.

J. W. W.

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[The Therapeutic Use of Cod Liver Oil especially in Ophthalmology. (Trans. title.) Darraspen, E., Chelle, P. L., Florio, R., and Meyandi, M. H. (1938.) *Rev. Méd. vét.* **90.** 680.]

The beneficial effect of cod liver oil in promoting cicatrisation in the treatment of wounds and burns is well established. An account is given of the results obtained by treating various conditions of the eye by the instillation of cod liver oil in the conjunctival sac. In cases of corneal ulceration, due to traumatic or other causes, cicatrisation is accelerated by the use of cod liver oil. When secondary infection has occurred and the eye is painful four or five drops of cod liver oil on the cornea produces an immediate analgesic effect; the eye can thus be properly examined and any pus washed from the conjunctival sac. In chronic cases cod liver oil proved successful when other collyria failed. If photophobia is present this is relieved by cod liver oil.

Ointments in which vitamins A and D are alone incorporated are not so effective as cod liver oil; the lecithin, iodide sulphur and phosphous content of cod liver oil certainly have an antiseptic value. Experimental evidence indicates that both vitamins A and D stimulate cellular metabolism and mitosis and so promote healing, but vitamin A is considered to be the most significant in this respect, especially with regard to epithelial cells. Vitamin D also appears to increase the resistance of tissue cells to bacterial invasion while it possesses analgesic properties in addition.

A. T. P.

AIR RAID PRECAUTION (ANIMALS) SERVICE

N.V.M.A. Scheme

We reproduce below the text of a Scheme for an Air Raid Precaution Service for Animals prepared by the National Emergency Committee of the N.V.M.A. and submitted by them to the Air Raid Precautions Department of the Home Office for adoption. This scheme is also being brought before the Divisions of the Association.

. . . . .

The A.R.P. Service for dealing with animals should come within the framework of the A.R.P. services in general.

The whole A.R.P. (Animals) Service should be co-ordinated under a veterinary administrator attached to the Animal Protection Committee of the Home Office who should be held responsible for its supervision throughout the country. Close local co-operation should also be maintained by the appointment of a veterinary surgeon resident in each district to a seat on the local A.R.P. Committee (see later under general organisation).

Objects and Extent of the Service Required.

The main objects of an A.R.P. (Animals) Service will be:—

(*i*) The conservation of animals of economic value, living or dead.

(*ii*) The provision and protection of food supplies for essential animals.

(*iii*) The protection of human beings from panic-stricken or gas-contaminated animals, and

(*iv*) The prevention of unnecessary animal suffering.

The extent of the Service required will be influenced, both generally and locally, by Government decision regarding the evacuation or compulsory slaughter of animals other than those of economic value. The responsibility for the evacuation of animals and for their control in the interests of the public safety must be entirely with the owner or his agent. In an emergency animals which are found loose and likely to endanger the public safety should be disposed of as the local A.R.P. authority shall decide. The provision of food for evacuated animals will likewise be the responsibility of the owner, although official regulations governing food supplies will, no doubt, be enforced. Animals should only be evacuated to places where adequate supplies exist.

The needs of different areas vary enormously according to their situation, the numbers of animals at risk and the extent of possible danger for human beings. These should be assessed locally and schemes of appropriate extent drawn up. All should, however, be based on a skeleton scheme. A fully equipped veterinary post would only be necessary in dangerous areas.

It should be borne in mind that some redistribution of animals would probably follow an outbreak of hostilities. Horses, *e.g.*, would probably be used in increased numbers in towns, whilst many small animals of all kinds would be killed or evacuated.

Personnel available.—The personnel available for the A.R.P. (Animals) Service would include all veterinary surgeons other than those serving in His Majesty's Forces and whole-time officers of the Ministry of Agriculture. It is understood, however, that whole-time officers of the Ministry of Agriculture, whilst unable to take a fixed part in any given scheme, might be available in emergency and such officers should be members of the local A.R.P. (Animals) Sub-Committee, if such Committee be formed. The services of others accustomed to handling animals, *e.g.*, officers of animal welfare societies, slaughtermen, carters, kennelmen, and stockmen in general, would probably be available and should be sought.

General Organisation.—The A.R.P. (Animals) Service should be organised on a regional basis so as to form part of the A.R.P. scheme already in being. Each local A.R.P. Committee should appoint a veterinary surgeon as Chief A.R.P. (Animals) Officer.*

In boroughs the Chief A.R.P. (Animals) Officer would be immediately responsible for the direction of the scheme. In rural areas the responsibility would necessarily devolve to a great extent on the individual veterinary surgeons each of whom would deal with his particular district. Where there are two or more veterinary surgeons in a given urban or rural district, one should be appointed to assume responsibility for that district. It is desirable that officers responsible for a borough, county or district should have some knowledge of A.R.P. measures and be in a position to train other volunteers for this service.

The Chief A.R.P. (Animals) Officer should as stated above be a member of the corresponding area A.R.P. Committee. In the case of the smaller urban or rural areas, the veterinary surgeon immediately responsible should be a member of the local A.R.P. Committee.

In dangerous areas separate veterinary posts, supplies, transport, etc., should be made available or earmarked for the A.R.P. (Animals) Service. Vehicles should be reserved for, and marked "A.R.P. Veterinary Post."

Functions of the Local A.R.P. (Animals) Service.

(1) To ensure that all veterinary surgeons and other volunteers for this Service are acquainted with the nature and properties of war gases, the methods of their dispersal from the air and the principles of personal protection from these and other forms of aerial attack. (See A.R.P. Handbook No. 1.)

(2) To arrange for advice on preventive measures to be given to owners of large and small animals by personal contact, public meetings, etc.

(3) Arrangements for evacuation of animals. In the case of rural areas, to make or keep a register of suitable premises available for the reception of animals evacuated from more densely populated or dangerous areas. (The R.S.P.C.A. has offered to provide these registers.)

(4) To provide veterinary posts, personnel, supplies and transport.

(5) The training of the personnel in their duties.

(6) The treatment of animal casualties.

(7) The decontamination of animals and their equipment and (if necessary) buildings.

(8) The slaughter of dangerous or suffering animals.

(9) The removal of carcases and, when possible, their disposal in an economic manner.

Local Organisation for A.R.P. (Animals) Service.

Veterinary Posts should be established in each area. A veterinary post might be a veterinary surgeon's premises, the clinic of a humane society, a stable, or other suitable and central building (with telephone) which could easily be rendered gas-, splinter- and blast-proof. The number of posts would depend on the animal population at risk and be decided by the local committee. In dangerous areas provision should be made for the supplies, equipment and transport detailed in Appendices A and B. In other areas, *e.g.*, rural areas, little more than a skeleton organisation would be required.

Personnel.—Each post should have available for immediate duty at least:—

One veterinary surgeon (in charge).
Two men trained in veterinary first-aid.
Six men accustomed to handling animals, including two licensed slaughtermen.
Three motor drivers capable of driving heavy motor vehicles.
One man as clerk and telephonist.
In addition three trained men as reserves, in all a complement of one officer and 15 men.

Replication of personnel may be necessary in areas liable to be frequently raided or in the event of protective (gas) clothing having to be worn.

Special veterinary posts should be provided for markets, docks, lairages, menageries, and other places in which there are likely to be large numbers of animals.

The Chief A.R.P. (Animals) Officer will be responsible for getting an estimate of the number of animals of various kinds in the area, for ensuring that the authorised equipment, transport and supplies are available and should also know where further supplies can be obtained at short notice. He would be expected to train the other personnel of the A.R.P. (Animals) Service.

Members of the A.R.P. (Animals) Service should wear a distinguishing brassard bearing the letters A.R.P. in white letters on a blue base.

[Accompanying the scheme are appendices detailing (*a*) the personnel, the general and personal equipment deemed to be necessary to a veterinary post; (*b*) the contents requisite for a first-aid pouch; (*c*) anti-gas remedies and (*d*) methods for disposal of carcases.]

*The National Veterinary Medical Association of Great Britain and Ireland is willing to call meetings of all veterinary surgeons in a given county or borough to nominate a Chief A.R.P. (Animals) Officer for the area.

The Veterinary Record
June 24th, 1939.

Air Raid Precautions for Animals

MEASURES for the protection of the human populace in the event of raids by hostile aircraft have been under consideration for some years and have been implemented to a large extent since the crisis which caused the Prime Minister to make his historic journeys to Germany last autumn.

It is with anxiety that we of the veterinary profession view the paucity of official measures designed to protect animals, and the failure of the authorities to give a lead to the public in these matters is causing grave disquiet amongst a large section of the community.

To some extent this lack of interest by the authorities no doubt is due to the overriding fear of the inadequacy of the arrangements made for the protection of the human population. We attribute the almost complete lack of local schemes for animal protection to the fact that the authorities have been too busy considering the human aspect of A.R.P. to give consideration to the interests of animals.

We are confident that were a serious attempt made to estimate the animal population of some of our larger towns the figures would prove a revelation. The number of small animals alone is stupendous. In West Ham, with a human population of 260,000 and an area of only seven square miles, it is estimated that there are no fewer than 20,000 dogs and 60,000 cats, in addition to poultry, small pets and the larger animals. We are informed that a reasonable estimate of the animal population of this borough is 100,000.

The scarcity of "animal-minded" persons in the service of urban local authorities has not made the subject an easy one even for the local authorities mostly concerned and we suspect that, on this account, animals have been conveniently forgotten in many instances.

The N.V.M.A., however, has not been unmindful of the duty which veterinarians owe to their charges and, despite the criticisms contained in a recent letter in our columns, it can claim the credit of having been the first organised body to move in these matters.

In March, 1935, Mr. Prime, of Norwood, wrote a short letter which received publication in our paper drawing attention to the fact that the authorities were initiating measures for Air Raid Protection and pointing out the need of including in these measures protective arrangements for animals.

The General Purposes Committee of this Association gave consideration to this aspect of A.R.P. and as a result representations were made to the Home Office. It was eventually agreed that veterinary surgeons should be invited to attend the courses of lectures to medical practitioners which the Home Office, in collaboration with the British Medical Association and its local branches, had directed to be given throughout the country.

The divisions of the "National" were notified of these arrangements and during 1936 and 1937 veterinary surgeons availed themselves of the opportunity to acquire knowledge of A.R.P., particularly with regard to "anti-gas measures."

Mr. Clayton, of Birkenhead, in March, 1937, read a paper on A.R.P. for animals to the Lancashire Division of the N.V.M.A. and as a result a resolution was passed urging the "National" to form a committee to consider the institution of protective measures for animals in the event of hostilities. This resolution, on presentation to the Council, was withdrawn when the sponsors were informed of the measures already being taken by the General Purposes Committee.

The Association continued to press for Government action and made further representations to the Home Office and also to the Ministry of Agriculture. In 1937 the Secretary of State for the Home Department, by warrant, set up a Committee "to advise him on questions arising in connection with the protection of domestic and captive animals against the results of air attack."

Members of the Committee were nominated, at the invitation of the Home Secretary, by the Ministry of Agriculture, the Royal Army Veterinary Corps, the R.C.V.S., and the N.V.M.A., whilst a senior Home Office A.R.P. official was made Chairman.

This Departmental Committee met for the first time in January, 1938. "Big bodies move slowly" and the "National" became impatient when the weeks and months slipped away without further meetings of this Committee being called. In the latter part of 1938 the "National" formed its own A.R.P. Committee; this Committee proceeded to collect information relative to injuries which might be inflicted on animals by war "gases" and other

means and to prepare a scheme for the protection of animals in the event of hostilities.

These facts become known at the Home Office and a second meeting of their Committee was called in January of this year, to which meeting the N.V.M.A., was invited to send a deputation. As a result, all members of the Association's Committee who were not already members of the official Committee were co-opted on to the latter. The N.V.M.A. was asked to prepare the draft of an official handbook on A.R.P. for animals. This was put in hand immediately, with the result that the draft handbook, together with a scheme for the establishment of an animal protection service, was prepared. Its publication is expected in the near future.

The Committee decided to enquire of animal welfare societies if they would be willing to assist in putting the scheme into operation, and a conference between this Committee and the animal welfare societies has been arranged and will take place shortly after we go to press with this issue.

Nevertheless, up to the present moment, no official Press announcement of this action has ever been made, and a few weeks ago the R.S.P.C.A., realising the pressing need for some guidance to horse owners and drivers on the care of horses which might be working in the streets of our cities during air raids, called a conference of interested parties at its headquarters in Jermyn Street.

This conference appointed a committee (upon which the profession was well represented) to draw up a list of recommendations to persons in charge of horses in large towns. The committee has completed its work and the R.S.P.C.A. is bringing the recommendations before the appropriate authorities.

The objects of the conference and the formation of the Committee have received wide publicity but it must be borne in mind that the conference was called to deal only with one aspect of A.R.P. for animals—an important aspect, our readers will appreciate, but only a small part of the problem as a whole.

The public, however, still remains largely oblivious to the need for A.R.P. measures for animals. Individual veterinary surgeons and local divisions of the "National" can do much to stimulate their local authorities to initiate the necessary action. A guide to the appropriate organisation will be found in the scheme recently adopted by the Council of the N.V.M.A. and published elsewhere in this issue.

REPORT

[Southern Rhodesia. Annual Report for the Year 1938.]

Owing to the greatly regretted death of Major G. C. Hooper Sharpe, M.C., M.R.C.V.S., on August 27th, 1938, the annual report for that year is presented by his successor, Mr. B. A. Myhill, who has been appointed Chief Veterinary Surgeon for Southern Rhodesia. This largely explains the brevity of the report which is by no means the lengthy encyclopaedia of veterinary diseases which we have learned to expect from that Colony. It is, however, the usual record of work well and truly performed.

From a veterinary point of view, the year may be described as fairly satisfactory, particularly in regard to the two diseases foot-and-mouth disease and African Coast fever. In the case of the former, only one outbreak, and that of a very mild nature, occurred—in the Bikita native district—and in the case of the latter four fresh outbreaks occurred in the Melsetter native district, with a mortality of 33 head. This district has always been a thorn in the side of the veterinary department and during the past 38 years Coast fever has repeatedly cropped up unexpectedly on farms where it has previously existed. The cause for these mysterious reappearances has yet to be ascertained. When once determined it may be found to explain why for so long a period this disease has defied the efforts of the veterinary department.

With regard to the outbreak of foot-and-mouth disease, the vitality of the virus appeared very low and rendered the collection of virus for the usually adopted method of inoculation impossible. The outbreak was also a very unsatisfactory one, owing to the indefiniteness of lesions and difficulty in determining the spread of infection. The usual control by means of cordons, spray-posts, special native constables and close inspections rendered the outbreak more prolonged than when the inoculation process is adopted.

Rhodesia marches with the times and her cattle now travel by motor lorry from quarantine areas to railhead and thence to the abattoirs—which may perhaps explain the 880 bruised fores and 605 hinds recorded in another part of the report.

Rabies is prevalent in Northern Rhodesia and as an example of the friendly co-operation existing between that Colony and its southern neighbour we find that four dogs suspected to be suffering from that disease were sent from Livingstone to Salisbury to be kept under observation. Two of the dogs developed symptoms of the disease which was confirmed

by biological test, and the remaining two were destroyed.

Outbreaks of anthrax appear to be more numerous than hitherto, and heartwater, quarter evil, malignant catarrh or "blind sickness" are briefly referred to. There are 790,159 cattle owned by Europeans and 1,567,656 by natives, and 3,449 dipping tanks in the territory. About 10,000,000 lb. of beef have been exported in cold storage to the United Kingdom during the year.

L. E. W. B.

REVIEW

[Clinical Studies in Lactation. By H. Waller, M.B., B.Ch. Published by Heinemann, London and Toronto.]

Dr. Waller has published the results of his observations during an extended experience of work among infant welfare centres and of the practical operation of some sections of the Maternity and Child Welfare Act of 1918.

The book is concerned with lactation in the human mother and at first glance may be regarded as too specific to be useful for a wider application to domesticated animals. It is mainly concerned with the subject of the reflex mechanism involved in milk secretion, as encountered by the clinician. In it is discussed the fundamental importance of breast-feeding, the force exerted by the baby, reflex outflows, engorgement, colostrum, mastitis, and so on. The problems as they affect the human clinician are not identical with those that concern the veterinarian, but there are many basic laws of lactation which are probably common to all species. In the more sensitive and specialised human organism, psychological problems would appear to play a more profound part than in animals, but it is possible to think of a parallel in a mare, cow, or bitch for almost each of the cases which are described where, short of actual diseased processes, a temporary or more permanent disturbance to the mechanism of milk secretion has occurred.

We should hesitate to advise all veterinarians to purchase and read the book, but we should suggest that those who wish a wide knowledge of lactation in all its aspects, might do well to read Dr. Waller's contribution to the general study drawn from his experience with human beings.

Under the scheme for the improvement of cattle, the Department of Agriculture for Scotland in 1938 supplied 102 Aberdeen-Angus bulls, 91 Shorthorns, 79 Highland, 3 Ayrshire, and 3 Galloway to the Highland counties and the Outer Isles.

N.V.M.A. DIVISIONAL REPORT

Lancashire Veterinary Association

Meetings at Manchester*

A general meeting of the Lancashire Association was held in the University of Manchester on Wednesday, March 8th, 1939, at 2.30 p.m.

The President, Dr. G. O. Davies, occupied the Chair and the following members and visitors signed the attendance book :—

Members : Mr. R. F. Bett, Professor J. F. Craig, Messrs. H. Davies, R. Greenhalgh, H. R. Hewetson, H. Holroyd, F. Hopkin, R. B. Hornby (student member), W. K. Johnstone, Mrs. K. G. R. Kelly, Messrs. R. C. Locke, A. B. Mattinson, G. Mayall, J. McGhee, R. H. Oddy, D. E. Orr, E. A. Pearce, C. F. Shawcross, G. N. Shirley, H. Sumner, C. T. Trevers, W. Walker, W. Woods, A. J. Wright and J. C. Baird (Hon. Secretary).

Visitors : Messrs. F. C. Asplin, N. Dobson, R. B. James, H. N. John, A. J. Limont, C. C. Marginson, V. R. Rajegopel and Miss P. Stubbs.

Apologies for absence were received from Messrs. R. Hughes, J. Holroyd, H. G. Hewetson, G. H. Locke and J. H. Wright.

The minutes of the last meeting (Manchester, November 9th, 1938) were approved and signed.

Correspondence.—The Hon. Secretary read a letter to the B.B.C. and their reply.

Nominations for Membership.—Mr. R. Isherwood, M.R.C.V.S., Warrington.

Election to Membership.—Miss P. Stubbs, M.R.C.V.S., Liverpool, and Mr. R. S. Roberts, F.R.C.V.S., Runcorn, having been nominated at a previous meeting, were elected to membership of the association.

The Hon. Secretary then read the Council report which was adopted. It was also agreed that the arrangements for the demonstration of the film on sterility should be left to the Council, and that a letter should be sent to Major J. F. D. Tutt expressing the sympathy of the members of the Association in his illness and their hopes for his speedy recovery.

Diseases of Poultry: Inaugural Lecture

The President (Dr. Davies), introducing Mr. Dobson, referred to the fact that this was the first of a series of lectures and demonstrations which had been arranged in the form of a refresher course so that practitioners would be better prepared should their services be required under the Poultry Bill which he was given to understand was shortly to be introduced. This

*Received for publication May 16th, 1939, and May 18th, 1939, respectively.

legislation, he stated, was a direct result of the recommendations made by the Poultry Technical Committee.

That afternoon they were to have their inaugural lecture and the Association were particularly fortunate in having secured Mr. Dobson to deliver it. Reference was also made to Mr. Dobson's work on poultry diseases and to the fact that he was one of the two members of the veterinary profession on the Poultry Technical Committee. Thus they could not have secured anybody better qualified to open the course. In calling upon Mr. Dobson to address the meeting, Dr. Davies said that to him it was a particular pleasure as Mr. Dobson was an old colleague of his.

VIRUS DISEASES OF POULTRY

N. Dobson

Veterinary Laboratory, Ministry of Agriculture
New Haw, Weybridge, Surrey

It gives me great pleasure to be present at the inauguration of the poultry classes at the invitation of the President. I have had the privilege on several occasions of visiting branches of the N.V.M.A. to speak on the diseases of poultry to members of the profession, and as you know many of these classes have been running now for some considerable time. I think that on the whole they have done a considerable amount of good; they have served to stimulate the members of the profession to devote a little more time and interest to poultry problems. Possibly we have as a profession been rather backward in that we have not regarded the poultry industry as one with a great field of work. It is a very large and valuable industry, and those members who are familiar with the various Government publications on the matter and the report of the Poultry Technical Committee will be aware of the magnitude of the industry. It ranks third in the branches of agriculture in this country, with an estimated output of above 30 million pounds sterling per annum for the sale of eggs and dressed poultry. It is known from experience and from various publications that disease takes an enormous toll from the poultry industry, with an estimated loss of about four million pounds sterling. Obviously the veterinary profession is the only one that can help the industry and attempt to reduce the enormous bill due to mortality. I do not believe that the profession is wholly to blame for its supposed apathy with regard to poultry diseases. In the past poultry owners have not been anxious to seek information from scientific sources. Many throughout the country have been very loath to seek information from those qualified to furnish it. The fact that disease existed on a farm soon became generally known if reported and some have considered this to be undesirable from the point of view of trade. There has therefore been a great tendency in the past not to disclose the occurrence of disease. Fortunately during the last three years or so, members of the industry have been much more frank; this has been particularly noticeable in the case of the well-known breeders. They have come forward at various meetings and confessed that they had, or had had, particular diseases in their stocks and that they had suffered losses. The amount of information collected during the Government's investigations and the very generous way in which poultry farmers have come forward and voluntarily given evidence before the Committee is really admirable.

There are remarkably few Acts and Orders in Great Britain dealing with poultry diseases. Fowl plague and Newcastle disease are classified as one disease "Fowl pest," under the Fowl Pest Order. They are grouped together because they are diseases of a very similar nature, both equally dangerous to the poultry industry. Neither of these diseases is known to be present in this country now, and the intention of the Order is to facilitate their eradication by means of slaughter on the occasion of any future occurrence.

Fowl plague and Newcastle disease are each caused by a virus. There has been for many years much scientific argument in favour of the view that these diseases are similar and are caused by the same virus. Many investigators nevertheless still maintain that they are separate diseases caused by different viruses.

Fowl plague is a disease which has a very widespread incidence throughout the world, particularly in Egypt, Palestine, Mesopotamia, India and the Far East. Records exist of the occurrence of this disease in this country. Two small outbreaks believed to be due to this virus occurred in 1922, and again in 1929, but no information is available that it has occurred since in Great Britain. The ordinary fowl is extraordinarily susceptible to fowl plague, but from the work of investigation in this country and elsewhere it is now clear that the pigeon is very, if not completely, resistant; this fact is useful in making a differential diagnosis. The usual route of infection appears to be by ingestion of foodstuffs contaminated with virus by droppings, and discharges of affected birds. The disease spreads rapidly and the mortality is usually 100 per cent. As regards the outbreaks observed in this country in 1922 and 1929 it is possible that owing to the fact that the entire flocks died from the disease further outbreaks were prevented. Fowl plague can quickly be transmitted from bird to bird by experimental inoculation. Under natural conditions the incubation period is three to five days, and following upon experimental inoculation 24 to 48 hours. The symptoms are few and not very

characteristic. Most birds when sick tend to go off their feed and show ruffled feathers, and many birds in the acute type of infection are merely found dead. The less acute cases show ruffled feathers, become dejected, listless, and the head is drawn into the body. Food is refused, but water is drunk freely. At the *post-mortem* examination some quite valuable features may be detected, but for a definite diagnosis it is necessary to carry out experimental inoculations. Petechial haemorrhages may be seen on the visceral surface of the sternum, on the epicardium and serous coat of the gizzard and accompanying fat. The gizzard has a very hard horny inner lining; this lining frequently becomes separated and haemorrhagic patches may be seen under the horny lining. The mucous membrane of the proventriculus and the duodenum often show petechial haemorrhages. These haemorrhages are suggestive of the condition but are not diagnostic. When we come to the consideration of Newcastle disease it will be obvious that similar lesions are frequently found in that disease. The diagnosis must be confirmed by inoculation experiments. Liver and spleen from a suspected case are emulsified and inoculated into a susceptible fowl and also into a pigeon. If the virus is present the inoculated bird will be found dead in about 24 to 48 hours while the pigeon remains quite normal.

I would like to stress the fact that although fowl plague has not been found in this country since 1929 there is always a possibility of its being re-introduced since both living birds and bird carcases are still imported from abroad.

Newcastle Disease.—This disease was first recorded by Doyle at Newcastle in 1926. That the outbreak occurred at a port is probably significant. It was at first suspected that the disease might be fowl plague, but subsequent work showed definite points of difference. Since Doyle's record of Newcastle disease in this country, reports of its occurrence in many other countries have appeared. It was reported afterwards from the Dutch East Indies, Irak and India. In India it is known as "Ranikhet disease." In all these countries most serious outbreaks have occurred, large areas have been denuded of poultry stock and the disease has spread with alarming rapidity. There were several outbreaks in Staffordshire and Shropshire following upon the initial outbreak at Newcastle. During the period 1927-33 there were no outbreaks in Great Britain. In 1933 the largest outbreak yet known occurred in Hertfordshire. Four of the largest poultry farms in the country were very close to one another, but fortunately the disease did not spread from the original outbreak. However, about 10,000 birds died or had to be destroyed on the infected farm. The common fowl is highly susceptible to Newcastle disease. Ducks and geese appear to be resistant but the pigeon, particularly the young pigeon, is susceptible. The symptoms of Newcastle disease are rather characteristic. The birds affected are found away from the main healthy flock, moping, and frequently in a crouching attitude owing to respiratory disturbance. The birds breathe through their mouths, there is a distinct gurgle or rattle, and beads of moisture may be seen hanging on the lower tip of the beak. The incubation period following experimental infection is longer than in fowl plague and is usually seven days. A very similar clinical picture is observed in the young pigeon, with definite paralysis of the wings and legs, and breathing through the mouth. Birds affected with Newcastle disease have a very sleepy appearance, the eyelids being fully or only half open. Some birds may be in a comatose condition. Mortality is very high, and may reach 90-100 per cent. One would expect to find some alteration in the respiratory organs to account for the symptoms. However, although there is marked respiratory distress during life, the trachea of the birds appears to be quite normal after death, so do the lungs, and it is only when the digestive tract is examined that a picture very similar to that seen in fowl plague is observed. Haemorrhages are found on the inner surface of the sternum, heart, proventriculus and gizzard fat. For the differential diagnosis of these two diseases the period of incubation is a guide. Under experimental conditions it is two days for fowl plague and seven days for Newcastle disease. The pigeon is not susceptible to fowl plague but the young pigeon is particularly so to Newcastle disease. Haemorrhages on the inner surface of the sternum and on the heart may be due not to a virus but to a bacteriological infection, such as fowl cholera. In the case of the latter disease it is possible to demonstrate a bipolar staining organism in the heart blood, and cultures from the liver and bone marrow may give a growth. The inoculation of the culture into a rabbit and a fowl would serve to establish the diagnosis of fowl cholera. Fowl plague and Newcastle disease, as you will note, have been only rarely reported in Great Britain, but nevertheless the introduction and subsequent spread of these two diseases into this country would lead undoubtedly to a very serious position, and one must always be alive to the possibility of these diseases being responsible when there is a sudden and high mortality on a farm. The position of the practitioner is that when he suspects from the mortality, and in the case of Newcastle disease from the symptoms, and *post-mortem* examinations, the presence of either of these diseases, under the Fowl Pest Order it is incumbent on him immediately to report the suspected existence of either

of these two diseases, to the Director, Laboratory of the Ministry of Agriculture and Fisheries, New Haw, Weybridge, Surrey.

Fowl Pox.—Fowl pox is a contagious disease due to a filter-passing virus, characterised by eruptive lesions on the unfeathered parts of the head and occasionally on the skin of the body, also by cheesy yellow membranes in the mouth, or by an ocular-nasal discharge. One or any combination of these lesions may be present. The lesions on the comb, head parts, around the eyes and on the wattles, are usually quite diagnostic. The lesions in the mouth are situated on the upper and lower surface of the tongue, around the frenulum and on the hard palate. In the third type there is nothing more than an ocular-nasal discharge, and no lesions may be detectable, but it is rather unusual to examine a flock and only find this type. There are usually some birds affected with the ocular-nasal type and some affected with the other two forms. The lesions on the comb start as a simple vesicle, and if this vesicle is ruptured a clear liquid exudes. Other lesions develop and they may be found on the other less thickly feathered parts of the head, around the eyelids, on the nostrils and on the wattles. These lesions in the early stages are white, turning later to yellow and then to brown, and there is a tendency for them to coalesce and form a rather warty type of growth. The lesions pass through all these stages and finally you find there is a healing condition under the scab formation, and the small wart-like scabs are flicked off with the movement of the bird's head. This dry material contains the virus, and it is a means of spreading the infection from bird to bird. In addition to the lesions on tne head, occasionally lesions may be found on other parts of the body. When a bird has a cold it has a tendency to wipe its beak under its wing, and there lesions may be seen later. These lesions are in the form of a rounded flat disc. The lesions may spread to the scaly parts of the legs. The lesions on the feet are not as suggestive of fowl pox as those found on the comb. The mouth lesions may be on the dorsum of the tongue, on the frenulum and the hard palate and particularly around the commissures of the beak. They are of a cheesy nature, whitish to pale yellow and quite easily removed with a scalpel, when a raw red surface is disclosed. If this material is removed in one or two days' time a replacement of the false membrane occurs, until in some birds a thick pad is formed under the tongue, so thick that the bird is unable to close its mouth or feed. This condition is frequently found in turkeys. The owners report that the birds attempt to feed but are unable to pick up the food. These lesions in the mouth parts are suggestive of fowl pox, but they may also be due to dietetic conditions. Diagnosis is made by scraping the material from the lesions on the mouth, scarifying the comb and applying some of the material to the scarified area. In five or six days' time typical lesions are seen. If the birds show an ocular-nasal discharge and it is not possible to decide the nature of the infection from a cursory examination, material may similarly be applied to the scarified comb. These are the common sites for the lesions of fowl pox. The common fowl and turkeys are susceptible. Ducks and geese do not appear to be susceptible, but the pigeon is susceptible to pox, but it has a pox virus of its own, pigeon pox. In the pigeon, lesions are seen very similar to those in the fowl, around the eyes, commissures of the beak and on the head. The pigeon pox virus has been used to make a vaccine which gives a considerable immunity to the fowl. The process of vaccinating the fowl is very simple. Nine to twelve feathers are removed from the front of the leg of the bird, the area is painted with vaccine, lightly scarified and then repainted with vaccine. The immunity develops in about 14 days following vaccination and lasts about six months. Prior to vaccinating a flock, all birds showing lesions of fowl pox should be removed and slaughtered. Careful cleansing and disinfection of houses and equipment should be carried out following the removal of the infected birds.

There is one other disease of birds caused by a virus, to which I should like to refer, and that is *Infectious Laryngotracheitis*, a disease which has been known in the U.S.A. and Canada for many years. It was not known to exist in this country until 1935. We believed that the outbreak studied then was the first in Great Britain, but in the course of the next three months we found that this was not so. It was the first time the disease had been diagnosed in this country, but it was not the initial outbreak. When subsequently investigating outbreaks on other fattening plants, the owners stated that they had experienced losses from this disease in previous years. The history of this disease in America and Canada is that it is associated with the fattening plants of the west country. Birds from the various farms are taken to the fattening yards and whilst there the disease breaks out, probably being introduced by "carriers." In the earlier stages of our investigations in this country a similar position was found. The first outbreak was in a Norfolk fattening yard where 100,000 birds a year are brought in for the usual period of three weeks' fattening before being slaughtered. In October the poultry owner with a lifetime experience of poultry keeping detected this particular condition, and he immediately noted that it was something quite different from anything he had seen before. The policy of destroying all affected birds was carried out until after Christmas trade was completed and then a notification

was sent to the Laboratory. The owner adopted the practice of keeping five to eight birds in a small wooden coop. The birds were subjected to trough feeding or forced feeding with the tube passing from bird to bird, a procedure favourable to the transmission of any contagious disease. The cleansing of the yard and cages and disinfection were not carried out. The affected birds were killed in the morning and the cages filled again in the afternoon with fresh stock. In this way the disease was transmitted from one group of birds to another. This was the method of feeding adopted on the farm on which the original outbreak occurred but later the disease was encountered on ordinary poultry farms. The disease may be encountered in the domestic fowl and in turkeys and pheasants. Ducks and geese are not susceptible. The incubation period varies widely, from two to 21 days. The early symptoms noted may be a slight watering of the eye, accompanied by a frothy bubbling. The bird may breathe through the mouth, when a rattling or gurgling sound in the throat may be heard. In the interval between spasmodic attacks the bird may appear bright and normal. When making an examination of a flock of birds it is quite a good plan to hustle the birds, and the respiratory symptoms may then be detected. The symptoms may be seen during a period of two to three days, and eventually the affected bird may recover. The bird after a violent attack of coughing and shaking of the head, appears as though it is trying to eject some obstruction in its trachea. In the peracute type of the disease, after a violent attack of coughing a clot of blood may be ejected. In the ordinary acute type, instead of there being only a clot of blood, a diphtheritic deposit may occur on the trachea. This can often be seen in the living bird if the mouth is opened and the larynx pressed forward. A chronic form of the disease exists and in this type in the living bird a plug of cheesy material, partially or fully occluding the glottis, may be found. These are the three types of the disease. There is a very great tendency for one type to merge into another. The bird may recover if it is capable of ejecting these clots of blood, etc. However, one of the features of this disease is that many of the recovered birds become carriers, and are liable to initiate another outbreak when placed in contact with susceptible birds. Our recommendations regarding the handling of an outbreak are that the affected birds should be slaughtered and that contact birds should be isolated. This is advisable because some of these birds may have had a slight attack and become carriers, and it is important to prevent contact of these birds with young growing stock. The disease can affect birds of all ages, young chicks from a battery brooder and birds four to five years old have been found affected. The incidence of the disease varies widely. On some farms only a few birds may be found to be affected. There is an extremely wide variation in the virulence of the infective agent and the susceptibility of the birds. On large general farms a mortality of 60 per cent. or more has been encountered, and on many of these farms the slaughter of the entire stock has been the only method of eradicating the disease.

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Mr. Dobson then projected a series of lantern slides showing affected birds at various stages of the different diseases. He also gave four rules for the prevention of the introduction of disease :—

1. Isolate all birds after shows, egg laying trials, etc., for one month and examine them twice a week. Isolation can be arranged by using pens at a reasonable distance from healthy stock.

2. Never put an emaciated bird with healthy stock ; it may be affected with tuberculosis, coccidiosis, or heavily infested with worms.

3. Comb and mouth should be examined during the period of isolation for evidence of fowl pox.

4. All newly purchased breeding stock should be submitted to the agglutination test as a protection against the introduction of bacillary white diarrhoea carriers.

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Discussion

Dr. DAVIES said he was sure they would agree with him that they had made a very excellent start to the Refresher Course with a most interesting and instructive talk, and that they had had sufficient evidence to show that Mr. Dobson was a master of his subject. The meeting was then declared open for discussion.

Professor CRAIG said that he wished to assure Mr. Dobson of their great appreciation of his able address, of his very clear account of the diseases which he discussed, of the excellent morbid specimens and the beautiful lantern slides which he displayed.

He was glad to note that at the beginning of Mr. Dobson's address he indicated a change of attitude on the part of poultry keepers regarding their losses from disease. Owners were not anxious that their troubles from disease should be broadcast and it was a great step forward when this idea of secrecy was abandoned. It would permit of a wider knowledge being gained of the prevalence of various diseases and was an incentive to increased research which was bound to lead to the introduction of improved preventive and control measures.

In surveying the increasing number of poultry diseases many of them proved to be due

to viruses, which developed in this country as apparently new diseases; one wondered where they were all coming from. The evidence in favour of their importation as, *e.g.*, in Newcastle disease was wanting. It was possible that in some diseases the affections had at first been mild and had caused few losses and later from various causes had been exalted in virulence or had more opportunities for dissemination. The history of B.W.D. in that connection was interesting when one realised that its importance and prevalence were enormously increased by the widespread use of incubators.

It was obvious that Mr. Dobson in the time at his disposal could only describe the typical cases of the various poultry diseases under discussion and could not go into great detail of differential diagnosis. Nothing more could be expected.

Perhaps one ought to emphasise in the very acute affections that one had to take into account not only the symptoms and lesions but also the number of animals affected. If, *e.g.*, one found a few haemorrhages in the proventriculus of a dead fowl and no other birds showed any symptoms and no other losses had occurred one would naturally be very reluctant to put such a case down as suspicious of fowl plague or Newcastle disease. Then again in regard to fowl pox, one sometimes found a few small white circumscribed patches on the mucous membrane under the tongue or at the side of the beak which were obviously the result of an injury but might at the outset be mistaken for fowl pox.

In some cases of fowl pox sudden death occurs from the development of white necrotic patches of mucous membrane which were closely adherent and had completely closed the opening. There might be no lesions elsewhere.

Nutritional roup, where little white raised spots or pustules appeared in considerable numbers on the pharyngeal and oesophageal mucous membrane, was also easily differentiated and in those cases the losses were not great.

The oculo-nasal lesions of fowl pox were, however, difficult to distinguish from roup in single cases without resorting to inoculation, and he would endorse the view expressed by Mr. Dobson that attention must be paid to the appearance of comb or wattle lesions or mouth lesions in some of the other birds in an outbreak.

In turkeys a disease like roup was sometimes seen associated with a nasal discharge and distension of the suborbital sinuses with muco-pus. It appeared to be peculiar to the turkey, looked like roup and was probably a virus disease.

With regard to vaccination he wondered whether Mr. Dobson would recommend its use in all outbreaks of fowl pox. For his part he thought that it should only be adopted when control measures could not eradicate the affection.

Last of all, regarding infectious laryngo-tracheitis, one had no definite evidence as to the source of infection in this country and even in individual outbreaks it was impossible to trace its origin.

The mortality and morbidity varied a great deal in different outbreaks and in some outbreaks of suspected laryngo-tracheitis in their hands attempts at artificial infection had failed.

Many of the outbreaks in egg-laying and fattening plants were very virulent and the losses were high, the affected birds being wiped out in a short time. Sometimes the disease was confined to a portion of the plant. In one recent outbreak, affecting a flock of 3,000 birds kept for egg-laying and on the intensive system, the disease was confined to two sections and when precautions were taken and the birds in the affected section were disposed of, no further trouble occurred. The fowls in this flock were purchased as laying hens or pullets and were bought in Ireland.

But there were other outbreaks where the losses were small. In one instance where suspected laryngo-tracheitis appeared in an egg-laying trial, in a number of pens there appeared what were almost isolated and fatal cases of laryngo-tracheitis. The material from the trachea of these birds was taken and inoculated into experimental fowls without result. In the same or other pens a proportion of the birds became affected with catarrh and recovered.

After the outbreak ceased, the problem that arose was as to the action to be taken with regard to recovered or in-contact birds. There was the possibility of carriers. To ascertain whether such carriers were present, the suspected birds were placed in contact with fowls from healthy flocks. There was no appearance of the disease in the in-contact birds. It was therefore taken in this instance that the probability was against the presence of carriers.

The course to be adopted in any particular outbreak must be influenced by the virulence of the disease and the circumstances under which it occurs.

In America a cloacal method of vaccination had been introduced against laryngo-tracheitis. Its value had still to be ascertained and he would be interested to know whether Mr. Dobson had any experience of its use.

Finally, he wished to thank Mr. Dobson for his instructive address. His work in connection with the diseases he described was well known.

Mr. Mayall said he would just like to ask if there was such a thing as laryngitis without tracheitis. He wondered if Mr. Dobson had ever seen a case of foot-and-mouth disease in the fowl, which people said was due to a virus or

the in-contact birds. Had he ever seen a case of rabies in a fowl?

Owing to the lateness of the hour, the President closed the discussion at this point and called upon Mr. Dobson to reply to the various matters raised.

The Reply

Mr. Dobson, in reply, said with regard to the question raised by Professor Craig they all knew how difficult it was to ascertain the origin of a disease and that the information one was able to glean might be very misleading. Concerning Newcastle disease nothing could be found which might have given any lead to the method of the introduction of the disease into Great Britain. One must remember that Doyle's investigations were of the first known occurrence in the world, and there was no history of imported birds. With regard to infectious laryngo-tracheitis, in the first outbreak they thought they had discovered the primary outbreak of the disease in this country, but soon afterwards they found other occurrences of the disease and in one particular fattening plant in Sussex, a very reliable and careful owner stated he was sure he had seen exactly the same symptoms five or six years previously. It was a very worrying piece of information. How might infectious laryngo-tracheitis have arrived in this country? No bird imported from overseas had been found to be affected. Birds were imported from time to time from the United States of America for stock purposes and it was possible that a "carrier" bird might have been introduced in this manner.

Mr. Dobson thanked Professor Craig for the many additional remarks he had made, and said it was extremely difficult to know where to stop when one had only a short time at one's disposal. He would have preferred to compare one disease with another and so bring the picture together.

In reply to the question on fowl pox vaccination, he said when a bird was received in a routine *post-mortem* service there was frequently no history or details sent by the owner. In such cases one could only recommend slaughter of the affected, vaccination of the remainder of the flock, and adequate cleansing and disinfection of the houses and utensils, etc. If a visit could be paid to the farm and the flock carefully examined, it might be found practicable to kill off the affected and vaccinate the contacts in that section of the farm. It was essential to impress upon poultry owners the necessity of killing the affected birds in order to remove the gross infection and lessen the risk of the infection being carried from one part of the farm to another. Where infection was present in a flock precautionary measures should be taken to prevent the handling of the birds being a means of spreading the infection.

Regarding the question asked about pharyngitis, Mr. Dobson said he had not seen it, but that on ordinary *post-mortem* examination one would find a very congested appearance of the pharynx in many birds which have been killed.

As regards foot-and-mouth disease, he knew that it was popularly stated that birds were susceptible but he did not know of any case. When giving a lecture before the same question had been asked and a gentleman said then that he had seen the disease in some ducks. As far as they could ascertain it was a congenital deformity of the web of the foot. They had tried to infect fowls and ducks with the virus of foot-and-mouth disease. The virus could be picked up by birds, passed through the intestinal tract and be recovered in an infective condition. In the inoculated birds the virus persisted two or three days but there was no suspicion of the birds showing lesions of the disease.

Mr. Dobson said he had never seen a case of rabies in fowls.

Mr. H. Raynor Hewetson, moving a vote of thanks to Mr. Dobson, said that the fact that they had so many in the class would show their appreciation of Mr. Dobson's lecture. He could not adequately express their appreciation to Mr. Dobson, and only hoped that he would go back knowing that the members were taking such an interest in poultry diseases.

Mr. Locke, seconding the vote of thanks, said it had been a great pleasure to listen to Mr. Dobson and that they had learnt a great deal. He hoped that all their lectures would be as interesting, and that Mr. Dobson would visit them again at some future date and enlarge upon the subject.

Mr. Dobson, in reply, expressed the great pleasure it had given him to be present and thanked the President for his opening remarks, and Professor Craig, and the other speakers for theirs. He was sure the remainder of the meetings would be of interest to them and he was glad to see so many present. The portion of the course dealing with poultry husbandry should be of great interest, because many members of the profession had had little opportunity of studying the subject. When visiting poultry farms for disease investigation one soon found that it was essential to know the fundamental facts of incubation, rearing, feeding and breeding.

J. C. Baird, *Hon. Secretary.*

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The May Meeting

A general meeting of the Association was held at the Grand Hotel, Manchester, on Wednesday, May 10th, 1939, at 2.30 p.m. Dr. G. O. Davies occupied the Chair and other members present were: Messrs. T. Scott Anderson, J. C. Baird, J. McGhee, H. Raynor Hewetson, J. Holroyd, P. T. Lindsay, R. C. Locke, G. Mayall, E. A. Pearce, E. Prescott, R. S. Roberts, J. Spruell, Miss P. Stubbs, Messrs. H. Sumner, R. S. White, W. Woods, A. J. Wright and J. H. Wright.

Messrs. H. W. Steele-Bodger and R. E. Williams were present as visitors.

Apologies for inability to attend were received from: Professor J. F. Craig, Mr. H. G. Hewetson, Sir F. Hobday, Mr. R. Hughes, Mrs. K. G. R. Kelly, Messrs. G. H. Locke, T. Millington, A. L. Mullen, C. F. Shaweross and C. T. Trevers.

The minutes of the previous general meeting were read and approved.

Correspondence.—Letters were read from (*a*) Messrs. J. Cubby and J. Caldwell, tendering resignation from the Association owing to their inability to attend meetings. It was resolved to accept the resignations with regret.

(*b*) General Secretary, N.V.M.A., concerning the contagious abortion remedies.

(*c*) General Secretary N.V.M.A., enclosing recommendations for A.R.P. for animals. It was resolved to appoint a sub-committee to consider the organisation of the service within the area of the Association, the sub-committee to consist of the following, with power to co-opt: President, Hon. Secretary and Messrs. H. Sumner, P. T. Lindsay, A. J. Wright, H. R. Hewetson, C. F. Shawcross.

Nomination for Membership.—Mr. A. C. Shuttleworth, Liverpool.

Election of New Members.—Mr. H. Sumner proposed, seconded by Mr. J. Spruell, that Mr. R. Isherwood be elected to membership. The motion was carried. Miss M. D. R. Morse and Mr. G. Willis were nominated and elected Student Members.

Obituary.—The President expressed the sympathy of the Association with the relatives of Captain W. G. Burndred and Mr. J. K. Calderwood. Members rose in the appropriate manner.

Report.—The Secretary read a report of the last Council Meeting which was adopted.

Arising from the report, it was announced that arrangements were proceeding for the Summer Meeting to be held at Cheshire School of Agriculture, Reaseheath, on June 14th, 1939, and that the Autumn Meeting would be held in the School of Tropical Medicine, Liverpool, on September 27th.

The President informed the meeting that consideration was being given by the N.V.M.A. to Southport as the meeting place for the Congress, 1940. It was resolved to extend an invitation from the Lancashire Division to the N.V.M.A. to hold the Congress within the area of the Lancashire Division.

Veterinary Profession and the P.D.S.A.—The meeting went into committee to consider the proposed scheme of co-operation. After discussion in committee the General Meeting was resumed and the following resolution was carried :—

" The Lancashire Veterinary Association having considered and discussed the question of co-operation by the Veterinary Profession and the Peoples' Dispensary for Sick Animals have resolved :—

1. That the principle of rapprochement between the Veterinary Profession and the People's Dispensary for Sick Animals of the Poor be approved.
2. That no active co-operation by members of the profession with the P.D.S.A. should be made until a practicable scheme has been evolved and agreed upon between the National Veterinary Medical Association and the People's Dispensary for Sick Animals of the Poor.
3. That while not wishing to tie the hands of the negotiating committee, the Lancashire Association consider that it is vital that any agreed scheme should contain adequate safeguards that only animals whose owners are unable to pay a veterinary surgeon's fee should benefit under the scheme. Also no further clinic should be opened without consultation with the National Veterinary Medical Association, and the question of diagnosis and position of technical officers should receive special consideration."

The Secretary was instructed to send a copy of the resolution to the Registrar, Royal College of Veterinary Surgeons, and the N.V.M.A.

In the absence of further business the meeting was declared closed.

J. C. Baird, *Hon. Secretary.*

In Parliament

The Poultry Bill

In the House of Lords on June 15th, the Earl of Feversham, Parliamentary Secretary, Ministry of Agriculture, presented the Poultry Industry Bill to secure improvement in the health and quality of live poultry and in the marking of poultry and eggs; for making better provision for securing the marking of preserved eggs and the enforcement of the Merchandise Marks Acts, 1887 to 1938, with respect to imported eggs, and for regulating the importation of poultry and eggs.

[To leave the Lower House free to deal with other important legislation — the Agricultural Development Bill — the Poultry Bill has been removed from the Order Paper and passed to the House of Lords, where its provisions are being discussed. It will then be returned to Commons and if no other emergency arises it is confidently expected that the Bill will be on the Statute Book before the Autumn Recess.]

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The following questions and answers have been recorded in the House of Commons recently:—

Dangerous Drugs (Sale Restrictions)

Mr. Wakefield asked the Home Secretary whether his attention has been drawn to the facts in a case heard in Dublin police court, on Thursday, May 25th, which indicates that a company with offices in London and Dublin, have been taking advantage of the provisions of the poisons legislation of Eire to sell freely to the

public in Great Britain dangerous drugs, the sale of which is strictly controlled in this country; and to ask what steps he proposes to take to deal with this abuse?

Sir S. Hoare: Habit forming drugs which are within the scope of the Dangerous Drugs Act are subject to restrictions whether sold in the United Kingdom or sent into the United Kingdom as the result of a sale effected outside the United Kingdom. But the Pharmacy and Poisons Act applies only to sales in this country, and in the case to which my hon. Friend refers the drug was one which is subject to the Pharmacy Act but not to the Dangerous Drugs Act. To control the importation of all substances which are subject to the Pharmacy Act would, I think, cause much inconvenience to legitimate trade, and experience hitherto does not suggest that legislation for this purpose would be warranted.

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Centralised Slaughterhouses

Major Leighton asked the Minister of Agriculture what progress has been made by the Livestock Commission in the matter of the establishment of centralised slaughterhouses?

Sir W. Womersley: I have been asked to reply. As my right hon. Friend indicated in reply to a question asked by the hon. Member for Don Valley (Mr. T. Williams) on February 9th, twelve specific proposals for the establishment of central slaughterhouses were submitted to the Commission within the time allowed for the purpose.

These proposals have been examined by the Commission, who have naturally found it necessary to discuss the proposals in detail with the respective applicants. These discussions are now reaching their final stages. In the meantime the Livestock Advisory Committee have been given an opportunity of expressing any views of a general nature which they wished to advance regarding the selection of three from among the twelve applications.

As soon as the discussions to which I have referred are completed, the Commission will be able to proceed to their decision regarding the selection of three of the proposals for the experiments, and I understand that they hope shortly to arrive at their decision.

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Horses (Export)

Mr. Harvey asked the Secretary of State for War what arrangements are made to ensure that British Army horses, no longer required for Army service, should not eventually be sold in Continental markets without guarantee against subsequent ill-treatment?

Mr. Hore-Belisha: Horses no longer required for the Army, if passed as fit for sale by public auction, are sold in the open market with a sufficiently high reserve price to make it unprofitable for them to be bought for export.

Sir R. Gower asked the Secretary of State for War how many British Army horses have been purchased by or on behalf of the German Government during the past two years?

Mr. Hore-Belisha: I regret that this information is not available.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 28th.—Meeting of the Scottish Metropolitan Division, N.V.M.A., at the Station Hotel, Perth, 2.30 p.m.

June 29th.—Summer meeting of the South-Eastern Division, N.V.M.A., at the South-Eastern Agricultural College, Wye, Kent, 2.30 p.m.

June 30th and July 1st.—R.C.V.S. Written Examinations.

June 30th.—Meeting of the North of England Division, N.V.M.A., at the White Swan Hotel, Alnwick, 2.30 p.m.

July 3rd.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

July 7th.—Annual General Meeting of the Sussex Division, N.V.M.A., at the Old Ship Hotel, Brighton, 2.30 p.m.

July 23rd—28th.—N.V.M.A. Congress at Great Yarmouth and Gorleston-on-Sea.

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ROYAL COLLEGE OF VETERINARY SURGEONS

Diploma in Veterinary State Medicine

On the results of the examination held by the Royal College of Veterinary Surgeons in Glasgow, from June 12th to 14th, the following candidates have been awarded the Diploma in Veterinary State Medicine:—

Forrest, Stewart.
MacAllister, D. I.
Wilson, Andrew.

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TUBERCULIN TESTING OF PIGS

Members of the profession who have had experience of tuberculin testing in swine are requested to forward observations on this subject to the General Secretary, N.V.M.A., for transmission to the Special Committee on Tuberculin Testing.

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THE LATE MR. L. W. HEELIS, M.R.C.V.S.

Veterinary surgeons and agriculturists from all parts of Warwickshire attended the funeral at Solihull Parish Church on June 9th of Mr. Leonard William Heelis, of The Paddocks, Solihull, who, as recorded with much regret in our issue of June 3rd, passed away recently at the age of 64.

Members of the profession present were Messrs. G. F. Banham, A. W. Findlay, W. E. Ison, R. B. Palmer and C. Weighton.

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DANGEROUS DRUGS ACTS, 1920–1932

Following are the names of veterinary surgeons appearing in the official list of medical practitioners, veterinary surgeons, dentists, pharmacists, etc., whose authorities have been withdrawn by Order of the Secretary of State:—

Lowndes, John, "Charnwood," High Road, Shenfield, Essex (date of Gazette Notice February 25th, 1938);* McGregor, Edward Ingledew, 3, Cumberland Road, St. Albans, Herts (date of Gazette Notice June 30th, 1936);* Porter, Charles Herbert, 1, Union Road, Crediton, Devon (date of Gazette Notice June 24th, 1932).*

*A direction was also given by the Secretary of State that it shall not be lawful for this practitioner to give prescriptions for the purposes of the Dangerous Drugs Regulations. Home Office, April 29th, 1939.

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CENSORSHIP OF PROPRIETARY MEDICINE ADVERTISING

Addressing the members of the Proprietary Association at the annual meeting recently held in New York, a member of the Federal Trade Commission said that the public was becoming much less interested and showing less response to the type of advertising which continually calls for the corrective action of the Commission. He thought the time was not far distant when the unremitting efforts of the Commission and the voluntary efforts of the various forces co-operating to this common end would achieve far-reaching results to the general promotion of greater consumer satisfaction and general public welfare. Another speaker specified some of the pitfalls to be avoided in the phraseology of advertising copy; among the ailments which should be approached cautiously were rheumatism, nasal catarrh, and influenza, and he advised that sufficient scientific data should be gathered before vitamin claims were used in advertising. "When we read some of the proprietary medicine advertisements which appear in our own lay Press," comments the *Pharmaceutical Journal*, "we cannot escape the hope that one of these days a body, having similar functions and similar powers to those proposed by the Federal Trade Commission, will be established in Great Britain. It would make for cleaner advertising if there were in this country a commission which was empowered to serve a 'cease and desist' order on proprietors who make claims which cannot possibly be substantiated. After September 1st, when—in the event of the repeal of the Medicine Stamp duties—all vestige of restraint on the sale of medicines, save those which contain listed poisons, is removed, it will be more than ever desirable to establish here a censorship of medicine advertising. Reasonable control is clearly in the interests of reputable manufacturers, and just as the new Food, Drug and Cosmetic law of the United States was at first regarded with suspicion by American manufacturers of repute, but is now seen to be a useful measure, so, no doubt, the well-established confraternity on this side would find it to their advantage to have some sort of protection from unleashed competitors with no traditions to guide them. It is a safe assumption that the majority of British makers of proprietary medicines would not find themselves in opposition to a measure to protect them from competition depending for its success upon reprehensible methods of advertising."

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TUBERCULIN TESTS IN CATTLE

During the first 30 years or so of this century attempts to control bovine tuberculosis in Great Britain were based mainly on the detection of diseased animals by clinical examination and by bacteriological examination of their milk. In spite of the considerable sum of money spent in these examinations and in compensating farmers for condemned animals, little or no progress was made towards diminishing the total amount of tuberculous infection in cattle. It became clear that clinical examination could not be relied on to detect all diseased animals, and that bacteriological examination of the milk by guinea-pig inoculation, though in itself reliable, was too slow to be of much value in controlling the spread of infection from diseased to healthy animals. An alternative method of attack lay in detecting all infected animals, whether diseased or not, by means of the tuberculin test, eliminating all positive reactors, and breeding only from healthy animals. A scheme of this sort was introduced by the Ministry of Health in 1923, mainly with a view to providing tubercle-free milk for human consumption, but the number of producers who took advantage of it was very limited, and the members of the general public who were prepared to pay extra for the tuberculin-tested milk so produced were likewise too few to hold out any promise of its success. Any small hope that might have been entertained soon disappeared when it was found that milk of this type, though free from the risk of spreading tuberculosis, was nevertheless often infected with *Brucella abortus* and was capable of giving rise to undulant fever in man. Intensive study of the milk problem rendered it clear to the public health authorities that the only satisfactory way of supplying safe milk to the human population at a reasonable price was to submit it to some form of heat treatment such as pasteurisation. Once this was appreciated the elimination of tuberculosis from cattle ceased to be of primary medical importance and became henceforward a problem for the agriculturists and the veterinarians. The Ministry of Agriculture was not slow in realising this, and in 1937 it launched its attested herds scheme, the object of which was not to provide the public with safe milk but to eradicate tuberculosis from cattle and build up herds of animals completely free from this infection. With the support of the Milk Marketing Board this scheme was made attractive to producers by offering them one penny a gallon for their milk in addition to the penny which they could earn for producing clean milk. Large numbers of dairy farmers have taken advantage of this offer, and by the end of March, 1939, no fewer than 5,969 herds in Great Britain had become fully attested.

The basis of the Ministry of Agriculture's scheme is the tuberculin test. On this alone depends the fate of individual animals in the herd, and on this alone depends the certificate of attestation which can be given to the herd as a whole only when it has passed three consecutive tests at intervals of not less than 60 days without a single reactor. It follows that the

tuberculin test must be completely reliable, or at least as reliable as any biological test can be made. Unfortunately, however, there is very serious doubt about this aspect of the test. No one who has followed the articles and correspondence in the veterinary journals during the past few years can have failed to be impressed with the diversity of opinion existing about it among members of the veterinary profession. It was partly to determine what grounds there were for the numerous allegations made against it that Buxton and Glover undertook an investigation, the results of which have been published by the Agricultural Research Council[1] and were noted in our issue of June 3rd (page 1149).* These workers were table to show that the doping of animals to render them insensitive to tuberculin was not an easy task; that when repeated tests had to be made alterations in the degree of skin sensitivity could be avoided by giving the injections into areas of skin at least six inches apart; that skin sensitisation could be induced by three or four injections of unheated but not of heated tubercle-protein; and that, apart from the avian tubercle bacillus, Johne's bacillus, and possibly *Br. abortus*, non-specific sensitivity to tuberculin was not likely to result from infection with any organism other than the bovine tubercle bacillus. This information is clearly of importance, but it is a little surprising to learn that, though the technique of the double intradermal tuberculin test appears satisfactory, the type and potency of the tuberculin to be used, which necessarily affect the interpretation of the test, are still left open to the choice of the local veterinarian.

Large numbers of different types of tuberculin are in fact being used in this country. Since Montgomerie and Thomson[2] have recently shown that even the most reputable brands in current use differ considerably in potency, it would seem that the unrest among the veterinary profession is not far to seek. In human medicine tuberculin is now titrated in terms of an international standard, so that tuberculin of whatever origin can be brought to the same degree of potency. Is it not time that tuberculin for veterinary use was also standardised and that the use of any tuberculins other than those conforming to this standard was forbidden? Already considerable experience has been gained in this country in the standardisation of tuberculin for human use. Would it not be wise for our veterinary colleagues to draw upon this experience in order to diminish the possibility of error in a test on which the future success of the tuberculosis eradication scheme must ultimately depend?—*British Medical Journal.*

[1]Buxton, J. B., and Glover, R. E. (1939). "Tuberculin Tests in Cattle." Agric. Res. Counc. H.M. Stationery Office, London.

[2]Montgomerie, R. F., and Thomson, A. (1939). *Vet. Rec.*, **51**, 229.

*See also *Vet. Rec.* June 10th, page 737.—*Editor V.R.*

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MILK-BORNE SCARLET FEVER

The *British Medical Journal*, in an annotation appearing on May 6th, compares the picture painted by Juel-Henningsen and Ernst* in describing a recent outbreak of scarlet fever in Denmark with that provided by H. H. Scott in "Some Notable Epidemics." "If the plot of all these stories is more or less the same, the detective work entailed is always interesting," says the annotation, which continues: "The Danish outbreak began on April 13th, 1937, with the notification of about 20 cases of scarlet fever in Vejle, a community of about 25,000 people. On April 14th the outbreak culminated with the notification of about 40 cases. As most of the patients had been supplied with milk from the same dairy its owner was questioned, and he was able at once to state which was the milk cart and which were the farms providing milk for the part of the town where infection had broken out. Medical inspection of the farms led to the discovery of a hitherto undiagnosed case of scarlet fever in a milkmaid whose hands were peeling, and one of whose ears was discharging pus. She was at once admitted to hospital, and all the dairy's milk was pasteurised. The prompt elimination of the milkmaid as the source of infection was doubtless the reason why the outbreak ceased as abruptly as it had begun. The bacteriological examination revealed Lancefield's group A and Griffith's type 3 *Streptococcus pyogenes* in the pus from the milkmaid and in 108 of the 118 cases of scarlet fever. As in most such outbreaks the infection of the milk is maintained by mastitis in one or more cows, diligent search was made for disease of the udders in those that had supplied the offending milk. But though every cow was examined twice at an interval of six days, and the aid of the State Veterinary Serum Laboratory and of the State Serum Institute was invoked, neither the cows nor their milk proved to be infected. The milkmaid therefore seems to have been alone responsible for this outbreak, and it is remarkable that though raw milk is a poor culture-medium for the germ in question, and the cows did not co-operate in spreading the infection, she still succeeded in giving scarlet fever to 118 persons and angina faucium to about 50 others.

*Juel Henningson, E., and Ernst, J., *Ugeskr. Laeg.*, March 9, 1939, p. 298.

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WHAT SHOULD THE ANATOMIST TEACH?

"What should the anatomist teach?" is the title of a leading article appearing in the *British Medical Journal* of May 20th, which reads as follows:—

"Wise words concerning the teaching of anatomy to medical students come from Dr. Donald Mainland, who holds the chair of anatomy in Dalhousie University, Halifax, Nova Scotia.* 'British anatomy,' he holds, 'as taught to students, has for almost 100 years been not only dead and unscientific but in many respects unpractical.' American schools, on the other hand, he believes to possess 'a greater variety in their teaching than do British schools and, most important of all differences, the outlook of American anatomists is that of the earlier British anatomists, Harvey and Hunter.' He makes, however, this important admission: 'British anatomy is now being revivified by a return to the methods of Hunter without neglecting regional anatomy as American teachers have been apt to do. The change is coming rather more readily in England than in Scotland.' Certainly Professor Mainland is well qualified to compare anatomical teaching on both sides of the Atlantic. He learned his anatomy in Edinburgh, and for the past ten years has taught it in a University which has given him easy access

*Nova Scotia Medical Bulletin, May, 1938.

to colleagues in Canada as well as in the United States.

"Anatomy, in the opinion of many of its professors, has fallen on evil days; the time allotted to its teaching is being curtailed more and more. Professor Mainland does not bemoan the new conditions: on the contrary, he declares that 'to an anatomist with an unbiased view of the whole curriculum a small allotment of time is a challenge to make the best use of it.' He would save time, in the first place, by teaching the anatomy of the living body, using the dead body only as a means to this end. He would save time, in the second place, by teaching so that too great a strain is not made on the memory of his students; a multitude of isolated facts overwhelms the memory, whereas these same facts when strung on the string of practical clinical application are assimilated and retained. To teach in this way 'the anatomist must maintain an ever-renewed acquaintance with general and special medical literature and as far as possible attend clinical meetings.' He touches, too, on the relationship which ought to exist between anatomist and physiologist. 'It is doubtful,' he writes, 'if outside a medical school one would think of teaching the structure of a machine without mentioning how it works, as has long been done in British anatomy.' He holds that the movements of the body and of its organs, especially the physiology of joints, should fall within the purview of the anatomist. One cannot explain the structure of the heart unless its movements are considered at the same time, nor can the anatomy of the thorax and body wall be understood unless the mechanism of respiration is touched upon. Among those who receive a high meed of praise for additions made to modern practical anatomy a foremost place is given to the late Professor Wingate Todd, of Cleveland, who received his early anatomical training in Manchester.

"Should a teacher be dogmatic? Certainly many of the professors most belauded by their students gave all their statements clear-cut and fixed edges, whereas the truth is that every living structure is subject to a range of variation —sometimes of great range, sometimes not so great. Many of Professor Mainland's own investigations have been directed towards the range of variation which is met with in the blood of healthy and apparently normal individuals. 'Conflicting views,' he says, 'are often more educative than plain facts.' He is surely right, too, when he suggests that 'the whole medical course can do little more than set a student on the proper path, help him to learn for himself, and try to induce him to think.' One final and important piece of advice he offers to teachers. He counsels them not to overload the memories of their students with special subjects, but rather to guide them to the special publications they may appeal to in case of need."

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THE PLACENTA AS A DUCTLESS GLAND

"In a recent review of placental function," observes the *Lancet* in a recent issue, "Newton[1] concluded that the available evidence fell just short of proving actual internal secretion by the human placenta. The nearest approach to proof, he said, was the experiment of Kido,[2] who was able to grow human placental tissue in the anterior chamber of the rabbit's eye and to show that the rabbit responded by an ovarian reaction similar to that seen in the Friedman test; but there was a faint possibility, in spite of control experiments, that the graft contained enough stored gonadotropic material to bring about the response, or that this material, in addition to the operative disturbance, might have provoked a discharge from the anterior-pituitary gland.

"The experiments of Gey and his colleagues[3] carried out last year with the supernatant fluid from test-tube cultures of human placental cells seem finally to have proved that these produce a substance with properties similar to those of the "prolan" excreted in the urine during pregnancy. Experiments on the placentas of small animals have been gradually accumulating during the past four years, and the almost certain conclusion that they produce a substance acting on the ovaries has been confirmed by Astwood and Greep[4] who have been successful in making an active extract from rat placenta. It is perhaps doubtful whether these workers are wise in suggesting[5] that a generic name ('cyonin') should be conferred on chorionic hormones whose function is to prolong the life of the corpus luteum; though the worst that can be said of their proposal is that it is premature. The human placenta, for instance, secretes a 'prolan' which acts upon the ovaries of small animals, but not clearly on the ovaries of monkeys or women. This substance is not an oestrogen, but oestrogen is almost certainly also secreted. It has been shown by Westman[6] and others that oestrone itself will prolong the life of the corpus luteum in certain hypophysectomised animals. Neither oestrogen nor prolan succeeds in preserving the life of the human corpus luteum during the second half of pregnancy; though it is only fair to say that the excretion of prolan—or human cyonin—attains a maximum at about the same time as it becomes possible to remove the ovaries without disturbing pregnancy. It seems that the only way in which Astwood and Greep could explain the continued production of prolan is to assume that its influence is at this stage transferred from ovary to placenta, so as to ensure a supply of progesterone from the latter. There is strong circumstantial evidence for the production of progesterone by the placenta in increasing amounts as pregnancy proceeds,[7] but might this not be linked up with the increasing excretion of oestrogen? It now seems certain that the placenta secretes some non-oestrogenic substance which is different from anything produced by the anterior pituitary, and a name will have to be found for it. But animals differ so widely in the details of their endocrine management of pregnancy that, while the existence of a hormone ensuring an adequate supply of progesterone may be probable, the time does not yet seem ripe for assuming that a universal function of the placenta is to produce such a hormone which is at once non-oestrogenic and sufficiently well defined to deserve a name."

[1] Newton, W. H., *Physiol. Rev.* 1938. **18.** 419.
[2] Kido, I., *Zbl. Gynäk.* 1937. **61.** 1551.
[3] Gey, G. O., Seegar, G. E., and Hellman, L. M., *Science.* 1938. **88.** 306.
[4] Astwood, E. B., and Greep, R. O., *Proc. Soc. exp. Biol., N.Y.* 1938. **38.** 713.
[5] Astwood and Greep, *Science*, Jan. 27, 1939. p. 81.
[6] Westman, A., and Jacobsohn, D., *Acta obstet. gynec. scand.* 1937. **17.** 13.
[7] Browne, J. S. L., Henry, J. S., and Venning, E. N., *J. clin. Invest.* 1937. **16.** 678.

PIGS, WORMS AND INFLUENZA

"Swine-influenza is a disease prevalent in the middle western United States every winter," observes the *Lancet*, in a recent issue, and continues: "It was shown by Shope[1] that two agents are necessary for its development, *Haemophilus influenzae suis* (a close relative of Pfeiffer's bacillus) and the swine-influenza virus. This last was later found to be related to the virus of human influenza. The pig disease spreads readily by contact during the winter, but disappears during the summer; during that period the presence of the virus in the herds has not been detected. Shope[2] has now obtained evidence suggesting that in interepidemic periods the virus may persist in lungworms, of which two species regularly infest pigs in the middle west.

"These worms, *Metastrongylus elongatus* and *Choerostrongylus pudendotectus*, inhabit the bronchioles at the base of the pigs' lungs; embryonated ova are passed in the faeces and are duly ingested by earthworms, in which they hatch and develop; after weeks or years the earthworms may be eaten by pigs, and the liberated lungworms will then find their way to the pigs' respiratory tracts. Shope took faeces and bronchial exudate containing lungworms and their ova from pigs ill with swine-influenza; he then fed this material to earthworms, and after periods of one to three months gave the earthworms to pigs to eat, in hopes that these would then go down with swine-influenza; but nothing happened. Undismayed by this failure, he persevered and he was later able to show that influenza—proved genuine by the recovery of virus—could regularly be induced by intramuscular injections of *H. influenzae suis* into pigs previously fed with infected earthworms. The first injection of the bacteria, however, never gave rise to influenza; it appeared that the pigs had first to be sensitised to the organism, when a subsequent injection would lead to the results described. Injections of the haemophilus into pigs not fed with infected earthworms never produced influenza; nor did this follow ingestion of infected earthworms without the provocative injection of bacteria. Why this sensitisation and provocation were necessary is quite obscure, but it is probable that the rôle of the *H. influenzae suis* is non-specific in this type of experiment, since Shope has succeeded in producing influenza by a single intrapleural injection of calcium chloride into suitably prepared pigs.

"Proof that a virus can be carried in an intermediate helminth host during interepidemic periods would give epidemiologists and students of other virus-diseases much food for thought. The importance of the possible inferences makes it necessary that Shope's experiments should be studied critically and repeated carefully. It is unfortunate that he has so far been unable to demonstrate virus directly, either in presumably infected earthworms, or in the lungworms of swine thought to be ripe for provocation; such findings would prove his case conclusively. The necessity for a rather roundabout method of proving infection of the worms calls for particularly elaborate controls, satisfactory as these have been so far. What may seem to be a weakness in Shope's case may, however, turn out to be its most important feature. His own work with the rabbit papilloma[3] revealed that a virus may be present in the lesions it is causing without being directly demonstrable by transmission experiments. Such a finding with a virus not of the tumour-virus sort would be a substantial extension of our knowledge. These results with swine-influenza may well prove important for epidemiological studies in America, and may give a clue to the distribution of the disease in other countries. While they make us speculate once more where human influenza virus persists in interepidemic times, knowledge of human parasitic helminths does not render it very probable that the results will be directly applicable to the disease in man. Yet human influenza virus is being shown in the laboratory to be capable of infecting more and more animal species; some of these and their helminth parasites may one day be shown to come into the picture."

[1]Shope, R. E., *J. exp. Med.* 1931, **54**, 373.
[2]Shope, *Science*, May 12, 1939, p. 441.
[3]Shope, *J. exp. Med.* 1937, **65**, 219.

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A report on the operation of agricultural marketing schemes during 1937 has been issued by the Minister of Agriculture and Fisheries and the Secretary of State for Scotland. The accounts and balance sheets of the boards are printed as an appendix.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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NOMENCLATURE OF SUBSTANCES OF THE SULPHONAMIDE GROUP

To the Editor of the Veterinary Record

Sir,—We wish to make a plea for accuracy in the nomenclature of chemotherapeutic substances. There is already much confusion over these in the medical journals, and with the inevitable increase in the number of such compounds in the future, and their application to veterinary therapeutics, it is, we suggest, desirable that these substances should be designated in your columns by names which are accurate and which involve no doubt as to the substance intended. In this connection we would draw attention to the discussion by the North of England Division, N.V.M.A., on the paper concerning an outbreak of bovine enzoötic pneumonia, in your issue for May 27th, in which Mr. J. R. Rider is reported as referring to "the use of sulphonamide," which is not inaccurate if some drug of the sulphonamide group is intended, and one would not cavil at the omission of the indefinite article. We suggest, however, that it is desirable to refer specifically to the compound or compounds intended, since they differ considerably in their properties and activities.

A distinct error, and one which from our point of view is rather unfortunate, is made in the report of Mr. Mitchell's reply to the discussion, in which reference is made to "treatment with sulphanilamide." This name indicates one substance and one only, namely, paraminobenzenesulphonamide, whereas Mr. Mitchell specificially states in his paper that it

was our product M. & B. 693 which was used. The latter is, of course, quite distinct from sulphanilamide, in composition, properties and therapeutic value.

Yours faithfully,
PHARMACEUTICAL SPECIALITIES
(May & Baker), Ltd.
D. G. ARDLEY.

June 15th, 1939.

[In connection with the foregoing subject, Mr. T. M. Mitchell writes: "I wish to apologise for an error which appears in my published remarks following the discussion of my paper entitled 'An Outbreak of Bovine Enzootic Pneumonia,' read to the North of England Division on March 11th last, and published in the *Veterinary Record* on May 27th. Reference was made by me to the use of Messrs. May & Baker's product M. & B. 693 in the treatment of a number of cases. Unfortunately, in my reply to the discussion, I referred erroneously to treatment with sulphanilamide. The drug I had in mind was, of course, that which I had already mentioned, namely, M. & B. 693, a fact which becomes obvious in my subsequent remarks as to the cost of treatment."]

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INJURY TO THE SUPERFICIAL FLEXOR TENDON IN THE DOG

To the Editor of the Veterinary Record

Sir,—I should like to compliment Messrs. R. A. Crowther and H. A. King on their clinical communication which was published in your issue of June 10th, 1939.

Another factor which may predispose to injury of the superficial flexor tendon in the mid-metatarsal region is that, as a result of its attachment to the tuber calcis, the degree of tension in this tendon is greater than that of the deep flexor tendon, which plays over the hock joint unattached.

Yours faithfully,
C. W. OTTAWAY.
Royal Veterinary College and Hospital,
Camden Town,
London, N.W.1.

June 16th, 1939.

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SAND AS EVIDENCE OF SITE OF IMPACTION CAUSING EQUINE COLIC

To the Editor of the Veterinary Record

Sir,—Some time ago I had occasion to express a doubt in your columns as to whether impaction of the small intestine in the horse, in the absence of twist or volvulus, was a common cause of fatal colic.

Sand colic is well known to several people in this country as a result of their great experience in the South West African campaign and elsewhere, and it seems to be agreed among those (including myself) who have made many *post-mortem* examinations that the sand is found always impacted in the large intestine. If there was a common liability to impaction of the small intestine in the horse one would expect sometimes in fatal cases to find the sand impacted in the small intestine. This has not been my experience and if those of your readers who have also made *post-mortem* examinations of horses dying after sand colic have had the same experience it would be evidence against the theory that impaction of the small intestine with food débris is a common cause of equine colic.

Sand as a cause of impaction is more easily identified than anything else on *post-mortem* examination, and its conspicuous absence, in impacted form, from the small intestine suggests to me that the small intestine of the horse is what one might call fool-proof, so far as impaction is concerned.

Yours faithfully,
WAKEFIELD RAINEY.

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DIAGNOSIS OF SWINE FEVER

To the Editor of the Veterinary Record

Sir,—I am enclosing a cutting from *The Times* (June 12th, 1939) *re* swine fever.*

It would appear from this report that the disease in question is not being dealt with with any greater success than before April 1st, 1938: in fact the situation, so far as England is concerned, has considerably deteriorated.

My neighbour, Lord Bledisloe, questions "the competence of local veterinary officers to diagnose swine fever." This might have applied to me 18 months ago, but not now as I hold no appointment of any kind under the Ministry of Agriculture, being of the "ancien régime."

His lordship is obviously not *au fait* as to the Swine Fever Order, as he appears to be unaware of the limitations of panel A practitioners in the case of suspected swine fever. They are supposed to make a *post-mortem* examination—send away viscera—and say nothing. The diagnosis rests with other officials and these officials are very often an unconscionable time making up their minds as to "yea" or "nay" or even in giving an opinion at all.

Sir Merrik Burrell, also obviously not knowing the methods by which a diagnosis is or is not arrived at, gives a blind answer to a blind assertion, by obviously resorting to *blanda mendacia lingua.*

Yours faithfully,
J. W. HALL MASHETER.

Ruddle House,
Newnham-on-Severn.

June 13th, 1939.

*Our correspondent's enclosure is as follows:—

"It was reported by Professor J. Basil Buxton, Principal of the Royal Veterinary College, at the Council meeting of the Royal Agricultural Society that during the four weeks ended May 15th 212 outbreaks of swine fever were confirmed, against 63 during the corresponding period last year. With the exception of two in Scotland and twelve in Wales, all the outbreaks were in England. The total outbreaks since the beginning of the year now numbered 492, as against 140 at the same date last year. Questioning the competence of local veterinary officers to diagnose swine fever, Lord Bledisloe said that to his knowledge there had been several cases of a local veterinary officer certifying swine fever, whereas it was discovered, after considerable delay, that the animals were not suffering from this disease. In his view farmers should not be put to such inconvenience. Sir Merrik Burrell stated that every possible step was being taken to obviate this, particularly at the Ministry's research laboratories at Weybridge. At present it was extremely difficult to diagnose the disease until the pig had been killed."